



CLOSING THE MOBILE CONNECTIVITY GAP IN DEVELOPING ASIA AND THE PACIFIC

OCTOBER 2026

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On the cover: Mobile connectivity. Mobile internet. Mobile internet supports access to information, services, livelihoods, and opportunities across developing Asia and the Pacific.

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Foreword

Digital connectivity is now an essential infrastructure for the 21st century, underpinning economic growth, public service delivery, digital trade, and the adoption of transformative technologies such as artificial intelligence (AI). Across Asia and the Pacific (APAC), home to more than half of the world's population, digital technologies are reshaping economies and societies. Yet despite significant progress, more than a billion people in the region remain offline. Closing this gap is critical not only to ensure that no one is left behind, but also to unlock the full economic and social potential of digital transformation. As countries accelerate their digital transformation agendas, connectivity is increasingly the foundation for digital public infrastructure, digital services, data-driven innovation, and the adoption of AI across economies.

This joint report by the Asian Development Bank (ADB) and GSMA Intelligence provides a comprehensive data-driven assessment of mobile connectivity across Developing APAC. It highlights a fundamental shift: the challenge is no longer network coverage, with most of the population already covered by mobile broadband, but ensuring that people can access, afford, and trust the services available. Achieving universal connectivity therefore requires a clear focus on closing the usage gap and moving beyond coverage.

The findings underscore both the scale of the opportunity and the challenge ahead. Achieving near-universal connectivity by 2030 will require one of the largest digital infrastructure investment efforts undertaken in the region, mobilizing substantial public and private capital alongside coordinated action by governments, industry, and development partners. The economic case for action is compelling. Closing the connectivity gap could deliver an estimated \$230 billion uplift in gross domestic product by 2030, alongside wider socioeconomic benefits including poverty reduction, improved access to education and health care, and greater resilience. To realize this return, all stakeholders will need to act collaboratively and with purpose.

For the GSMA and its members, the report reinforces the industry's long-standing commitment to extend the benefits of mobile connectivity to all. Mobile operators are investing heavily in networks and services across the region, and this report highlights how enabling policy environments, such as reduced sector-specific taxation and reforming universal service funds, can further accelerate these efforts. At the same time, it emphasizes the growing importance of addressing nonnetwork barriers, from device affordability and digital skills to trust and safety, areas where collaboration across the ecosystem is essential.

For ADB, the findings point to a clear operational and strategic role in supporting its developing member countries to close the connectivity gap, as part of their broader development journeys. Connectivity is a foundational enabler of inclusive growth, supporting digital public infrastructure, government modernization, digital trade, regional integration, innovation ecosystems, and the responsible adoption of emerging technologies such as AI. Through its financing, technical assistance, and integrated support across policy, investment, and implementation, ADB is strongly positioned to support countries across the digital transformation journey. As a financier, knowledge partner, and convenor, ADB can help mobilize investment, strengthen enabling

frameworks, build institutional capacity, and foster collaboration among governments, the private sector, and development partners to develop interoperable, secure, and inclusive digital ecosystems.

For governments, this report provides a prompt call to action. It shows that connectivity is not merely a telecommunications objective but a strategic investment in inclusion, productivity, innovation, and resilience, thereby advancing national competitiveness. Alongside investments in digital infrastructure, the report highlights that targeted interventions can materially reduce the overall cost of achieving universal connectivity. With balanced policies and targets, governments can attract the necessary capital to close the connectivity gap and ensure that their citizens realize the benefits of an inclusive digital nation in an increasingly AI-enabled global economy.

The GSMA and ADB are committed to working together, and with stakeholders across the ecosystem, to support these digital ambitions. We hope this report serves as a catalyst for action and collaboration, helping to accelerate progress toward a more connected, inclusive and prosperous future for all.

Antonio Garcia Zaballos

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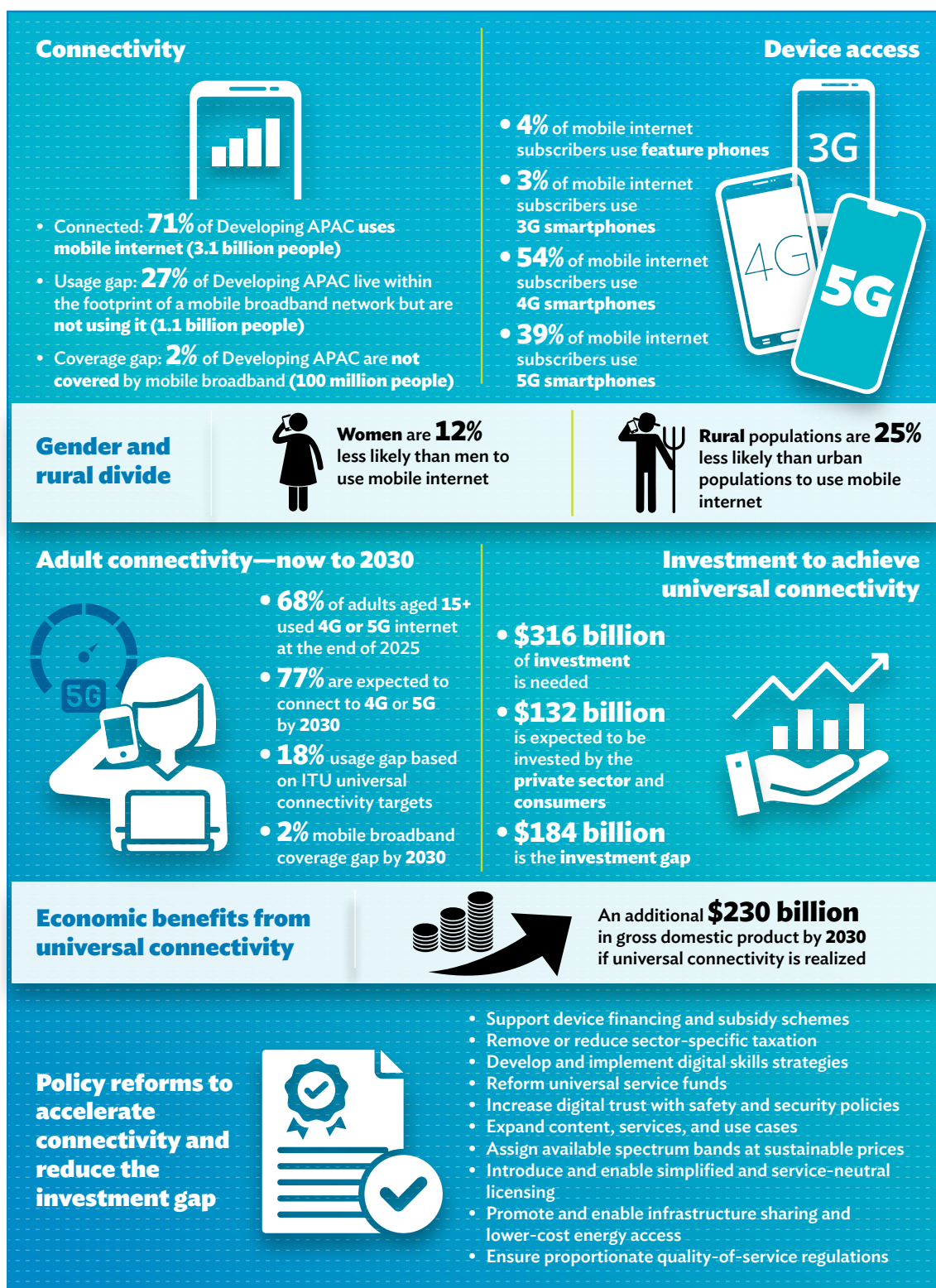
Abbreviations

ADB	–	Asian Development Bank
AI	–	artificial intelligence
APAC	–	Asia and the Pacific
DPI	–	digital public infrastructure
GB	–	gigabyte
GDP	–	gross domestic product
GHz	–	gigahertz
GNI	–	gross national income
ICT	–	information and communication technology
ITU	–	International Telecommunication Union
MCI	–	Mobile Connectivity Index
PRC	–	People's Republic of China

Report at a Glance

- Developing Asia and the Pacific (Developing APAC) is home to 4.3 billion people, more than half (52%) of the world's population. But 1.2 billion people are not online, accounting for just over 45% of the unconnected global population.
- 98% of the region's population live within reach of 4G networks, yet 1.1 billion people do not use these networks. This usage gap represents the main connectivity challenge.
- The coverage gap means another 100 million people are completely unconnected and remain outside existing 4G coverage areas. There remains a significant coverage gap in Central and West Asia, at 11% of the population, and in the Pacific developing member countries, at 16%.
- The vast majority (93%) of mobile internet users connect using either a 4G or 5G smartphones. 180 million mobile internet subscribers are using a feature phone or 3G smartphone, which translates to 7% of the subscriber base. This increases to 23% in Central and West Asia and 59% in the Pacific developing member countries.
- Significant digital divides persist within countries. The gender gap stood at 12% in 2025, meaning women are 12% less likely to use mobile internet than men. Rural populations were 25% less likely to use mobile internet than urban populations.
- The primary barriers to mobile internet adoption reported by unconnected consumers are device affordability, digital skills and literacy. Survey evidence also shows that safety and security are becoming increasingly significant concerns, particularly scams and fraud.
- The International Telecommunication Union has set a universal connectivity target of 95% mobile internet adoption among adults aged 15+ by 2030. It is expected that by 2030, 77% of adults in Developing APAC will be connected to the mobile internet using either 4G or 5G. This means there will still be an 18% usage gap against the International Telecommunication Union benchmark.
- To achieve universal mobile connectivity by 2030, it will require a total investment of approximately \$316 billion. Under current market and regulatory conditions, \$132 billion is expected to be invested by the private sector and consumers. Achieving universal connectivity by 2030 will therefore require additional investment of around \$184 billion.
- Just over 55% of the investment gap is driven by device affordability and addressing digital skills. This reflects their importance as the primary barriers to mobile internet adoption in the region. If the cost of device access and skills training were halved, the investment gap would fall from \$184 billion to \$119 billion.
- The economic case for closing this gap is significant. Closing the 4G connectivity gap by 2030 is estimated to deliver a gross domestic product uplift of around \$230 billion across Developing APAC. Universal connectivity would also have several wider socioeconomic benefits such as poverty reduction, improved education and health access, humanitarian assistance, and lower carbon emissions.

Figure: Report at a Glance



Executive Summary

This report presents the findings from a study by GSMA Intelligence on closing the mobile connectivity gap in Developing Asia and the Pacific (APAC), commissioned by the Asian Development Bank. The study covers 42 countries across five subregions—Central and West Asia, East Asia, the Pacific developing member countries, South Asia, and Southeast Asia—and provides a comprehensive assessment of current mobile service connectivity levels, barriers to adoption, investment requirements, and the economic benefits of achieving universal mobile connectivity by 2030.

Developing APAC is home to 4.3 billion people, more than half (52%) of the world's population. But 1.2 billion people are not online, accounting for just over 45% of the unconnected global population. Bridging the digital divide is not merely a technology challenge—it is a development imperative with far-reaching consequences for poverty reduction, education, health outcomes and economic growth.

Connectivity progress

Mobile internet usage across Developing APAC increased from 62% in 2020 to 71% in 2025. Ninety-eight percent of the region's population live within reach of 4G networks, yet 1.1 billion people do not use these networks. This usage gap therefore represents the main connectivity challenge, and the main barriers to connectivity relate to affordability, digital skills, safety and security concerns, and access to relevant content. The coverage gap means another 100 million people are completely unconnected and remain outside the existing 4G coverage areas.

There are significant differences in usage and coverage gaps by subregion. The proportion of the population using mobile internet ranges from 93% in East Asia (mostly accounted for by the People's Republic of China) to 36% in the Pacific developing member countries. There also remains a significant coverage gap in Central and West Asia at 11% and in the Pacific developing member countries at 16%. In terms of connectivity growth over the past 5 years, Southeast Asia stands out as by far the fastest-growing subregion, with mobile internet penetration increasing by almost 20 percentage points, reaching 76% at the end of 2025.

Reflecting the high level of 4G coverage and increasing 5G coverage, the vast majority (93%) of mobile internet users in Developing APAC connect using either a 4G or 5G smartphone, with significant growth in 5G adoption during the past 5 years. This is driven by a combination of internet users migrating from feature phones (2G) and 3G smartphones to 4G or 5G, as well as new users (who were previously not using mobile internet) connecting straight to newer technologies. However, within Developing APAC, 180 million mobile internet subscribers are using a feature phone or 3G smartphone, which translates to 7% of the subscriber base. This increases to 23% in Central and West Asia and 59% in the Pacific developing member countries. This technology divide has a significant impact on usage, as countries where more than 90% of mobile internet users are on 4G or 5G have 50% higher data usage per user than those with lower 4G/5G adoption.

Other types of the digital divide also persist within countries and subregions. The gender gap in Developing APAC stood at 12% in 2025, meaning women are 12% less likely to use mobile internet than men. This increases to 26% in South Asia. Rural populations are 25% less likely to use mobile internet than urban populations. This is even higher in certain countries and subregions: for example, 38% in the Pacific developing member countries and 35% in Central and West Asia. This is primarily due to barriers related to affordability, skills, safety, and access to relevant content. While these are the same barriers that also apply to urban populations, they are generally felt more acutely by rural communities.

In contrast, the Developed APAC region achieved 92% mobile internet adoption at the end of 2025 (compared to 71% for Developing APAC) and a coverage gap of less than 1%. Just over half of mobile internet users in Developed APAC are on 5G (compared to 39% in Developing APAC), with almost everyone else on 4G. This is in part because operators in many Developed APAC economies have either switched off or are sunsetting their 2G and 3G networks. As developed economies begin looking to the deployment of 6G by 2030 or shortly after, it is important that the rest of the region does not experience a widening technology and digital divide.

The primary barriers to mobile internet adoption reported by unconnected consumers are device affordability and digital skills and literacy. The average cost of an entry-level internet-enabled device in 2025 in Developing APAC was 31% of monthly gross national income (GNI) per capita, which is higher than the affordability threshold of 20%. For the poorest 40% of the population, the cost was almost double, at 61% of monthly GNI per capita. While these represent the primary barriers to adoption, survey evidence also shows that safety and security are becoming increasingly significant concerns, particularly scams and fraud. This highlights the importance of trust as a broader enabler of digital adoption. As digital services become increasingly AI-enabled, it will be important to ensure these are accessible and relevant in local languages.

For all countries in Developing APAC, achieving universal connectivity is ultimately one part (albeit a critical one) of becoming a digital nation. Governments increasingly rely on digitalization to boost productivity, drive innovation and enhance national competitiveness amid shifting demographics and growing geopolitical uncertainties. In addition to enabling digital services such as e-government, digital payments, and online platforms, connectivity has become a foundation of artificial intelligence and digital public infrastructure readiness.

The importance of connectivity is highlighted by the fact that countries that have made the most progress on becoming digital nations, such as the People's Republic of China, Malaysia, and Thailand, are also those with the greatest use of 4G and 5G connectivity. On the other side, countries with the lowest levels of connectivity are typically at the emerging stages of being a digital nation.

The investment gap

The International Telecommunication Union has set a universal connectivity target of 95% mobile internet adoption among adults aged 15+ by 2030, alongside 100% population coverage. In Developing APAC, it is expected that 77% of adults will be connected to the mobile internet using either 4G or 5G by 2030. This means there will still be an 18% usage gap against the International Telecommunication Union benchmark.

To achieve universal mobile connectivity by 2030 and address these gaps will require a total investment of approximately \$316 billion across Developing APAC. This captures network spend by operators and consumer spend on devices and mobile and satellite services. Under current market and regulatory conditions, \$132 billion is expected to be invested by the private sector and consumers, to connect around one-third of the offline population (310 million people). Achieving universal connectivity by 2030 (i.e., connecting the remaining

two-thirds or 650 million of the offline population) will therefore require additional investment of around \$184 billion. This is the investment gap that will emerge without policy intervention or additional financing to crowd in private sector development.

Just over 55% of the investment gap is driven by device affordability and addressing digital skills. This reflects their importance as the primary barriers to mobile internet adoption in the region. The model assumes \$100 device cost per user and a one-off basic skills training cost of \$40 per person. If these costs were halved, the investment gap would fall from \$184 billion to \$119 billion. The next biggest investment is the deployment of additional network capacity, as bringing 650 million new users onto 4G will require significant capacity upgrades in core and radio access networks to meet additional network traffic demand.

The investment gap for extending 4G coverage to 99% of the population is a small proportion of the total gap, reflecting the fact that the region has already achieved 98% 4G coverage. The remaining costs are subsidizing mobile service plans for the population segments that cannot afford them and enabling fixed satellite broadband access for the 1% that will not have 4G coverage. While mobile services are affordable for most of the Developing APAC population, with the average cost of 1 gigabyte being 1.7% of monthly GNI per capita (below the 2% International Telecommunication Union target), for the poorest 40% of the population, the average cost is 3.3% of monthly GNI per capita. For a 5 gigabyte plan, the average cost is 5.1% of monthly GNI per capita for the poorest 40%.

Beyond these barriers, it will also be important to address concerns around safety and security. This emphasizes the importance of trust as a broader enabler of digital adoption, including cybersecurity, data protection, and user confidence in digital platforms. Another barrier to address in certain markets is the availability of locally relevant content and services, which can be a particular challenge in linguistically diverse countries such as India, Indonesia, and Papua New Guinea.

The economic case for closing this gap is compelling. Closing the 4G connectivity gap by 2030 is estimated to deliver a gross domestic product uplift of around \$230 billion across Developing APAC. This implies an economic return between 20% and 100% from financing the investment gap. A 20% return would be achieved based on the most conservative cost assumptions in the investment modeling, including a \$100 device cost per user and a basic skills training cost of \$40 per person. If these were reduced to \$50 per device and \$20 of training per person, the economic return would be almost 100%.

The Pacific developing member countries subregion stands to benefit most proportionally, with a potential gross domestic product uplift of approximately 2% (or more than \$1 billion in economic benefit), due to the large share of their populations currently unconnected. Furthermore, universal connectivity would lead to a number of wider socioeconomic benefits such as poverty reduction, improved education and health access, humanitarian assistance, and lower carbon emissions.

Policy recommendations

To accelerate the adoption of 4G and 5G mobile internet by 2030, it will be necessary for many countries in the region to pursue several policy and regulatory reforms to unlock additional investment. They will also need to source additional financing from outside investors, including multilateral development banks and other development partners, to support these actions. The following table sets out policy reforms and interventions that would accelerate connectivity and reduce the investment gap (though it is not exhaustive). Asian Development Bank and other investors have a role to play in supporting these reforms, both in terms of technical assistance and leveraging various financing instruments, including blended finance, grants, concessional funding, and guarantees as needed.

Policy Reforms to Reduce the Investment Gap and Increase Connectivity

Policy Actions	Implications of Addressing the Investment Gap and Increasing Connectivity
Support device financing and subsidy schemes	Addressing device affordability will require governments to support device financing schemes. This could be done by lowering the financing risks and supporting credit-scoring innovations to expand access for unbanked users. Where device financing is not feasible, governments, investors, and the private sector can support device-subsidy programs. Barrier tackled: Device affordability
Remove or reduce sector-specific taxation	Sector-specific taxes on mobile services and handsets make them less affordable, especially to the poorest population segments. Reducing or removing these would improve affordability and stimulate demand, thereby bringing more people online, increasing demand and revenues, and therefore reducing the investment gap. Similarly, sector-specific taxes on mobile operators can distort and reduce investment in the sector. Reducing or removing these would increase investment in network coverage and capacity, which can drive greater internet adoption and country digitalization. Barrier tackled: Device affordability, mobile service affordability, coverage gap, network capacity
Develop and implement digital skills strategies	Governments, development partners, and private sector actors should partner to co-design and deliver relevant training programs aligned with consumer and business needs. At the same time, digital skills development should be embedded across national education systems, from primary to tertiary levels, ensuring that foundational and advanced digital competencies are systematically built over time. Barrier tackled: Digital skills
Reform universal service funds (USFs)	USFs have the potential to be used to finance investment gaps across all barriers. However, in many economies they have not been effective, with low disbursement rates and projects not being implemented expeditiously and systematically. In these cases, USF reforms are critical, and include adopting mechanisms to incentivize disbursement, setting clear and measurable targets, using data-led approaches to select network service deployment projects, ensuring regular performance monitoring and reporting, considering different funding mechanisms, and building capacity and skills within the USF governing authority. USFs should also be considered to address the main barriers related to skills, affordability and content. This could be done, for example, through subsidized access for low-income users, funding connectivity for schools, and broader information and communication technology programs combining devices, connectivity and services. Barrier tackled: Coverage gap, digital skills, device affordability, mobile service affordability
Increase digital trust with safety and security policies	Addressing scams and other safety and security concerns is critical to ensure consumer trust and confidence in using mobile internet, as well as minimize the economic and social costs of cybercrime. Governments should foster collaboration to incentivize innovation, promote consumer education, and improve reporting on scams. It is also important for governments to align their cybersecurity frameworks with international standards, adopt risk- and outcome-based regulation, implement security-by-design principles in mobile networks and digital services, and take a whole-of-ecosystem approach to security and safety. Barrier tackled: Safety and security

continued on next page

Table continued

Policy Actions	Implications of Addressing the Investment Gap and Increasing Connectivity
Expand content, services, and use cases	Many people in Developing APAC speak languages that have little to no digital footprint. This highlights the importance of funding and supporting local-language digital-content initiatives to incentivize uptake and use, particularly as digital services become AI-enabled. Mobile operators and technology companies can play a role by deploying language technologies at scale, convening partners and, in some cases, providing shared digital and AI infrastructure. Governments and policymakers can help create enabling environments for inclusive AI by investing in digital public infrastructure, affordable compute capacity and open, multilingual datasets, particularly for low-resource languages. In addition to accelerating internet connectivity, it is important to develop the broader digital ecosystem to maximize the social and economic benefits of digital transformation. This includes enabling services such as e-government, digital identity and digital payments, as well as digital public infrastructure and data governance. To achieve this requires whole-of-government approaches, including national digital strategies as well as roadmaps, cross-ministerial coordination and institutional governance frameworks for digital development. Barrier tackled: Local content and expanded use cases
Assign available spectrum bands at sustainable prices	Assigning available technology-neutral mobile spectrum at sustainable prices would help unlock additional investment and provide better-quality services to consumers. The assignment of mid-bands, specifically frequencies above 1 GHz, is critical to meet growing traffic demand, especially in urban areas, and would enable operators to better meet demand if 4G and 5G adoption is accelerated to achieve universal connectivity. The assignment of low bands (frequencies below 1 GHz) is critical to provide coverage and capacity in rural areas. Barrier tackled: Coverage gap and network capacity
Introduce and enable simplified and service-neutral licensing	Unified licensing frameworks that are service-neutral enable communication providers to offer a range of connectivity services on a single license, encouraging competition and innovation by enabling multi-access solutions. This can also enable smaller providers to cover niche areas, including remote regions, with the most efficient technology. It is also important that all providers of internet connectivity are regulated under clear, transparent, and consistent frameworks to enable competition and investment. Regulations or policies that are favorable to one type of service will ultimately distort investment and impact consumer welfare. Barrier tackled: Coverage gap and network capacity
Promote and enable infrastructure sharing and lower-cost energy access	Policies that promote and enable shared network infrastructure, where it is market-driven, can improve coverage and connectivity by enabling cost savings and enhancing competition. Policies that expand access to the electricity grid (either the main grid or mini-grid solutions) and renewable energy are also important to reduce the cost of network deployment, especially in rural and remote areas, and improve the reliability and resilience of mobile networks. Barrier tackled: Coverage gap, network capacity, and mobile service affordability
Ensure proportionate quality of service (QOS) regulations	Many regulators have imposed QOS regulations to improve consumer outcomes. However, these have often had negative and unintended consequences by increasing costs and requiring operators to dedicate investment on QOS parameters that consumers do not require and which are not financially sustainable. While reasonable baseline QOS parameters can be considered to ensure consistency in service, it is important that QOS requirements do not impose costs that displace more efficient investments. Barrier tackled: Coverage gap and mobile service affordability

AI = artificial intelligence, APAC = Asia and the Pacific.

Source: GSMA.





1

Introduction

This report presents the findings from research by GSMA Intelligence, commissioned by the Asian Development Bank (ADB), on closing the mobile connectivity gap in Developing Asia and the Pacific (Developing APAC). The study covers 42 markets across five subregions: Central and West Asia, East Asia, the Pacific developing member countries, South Asia and Southeast Asia (Table 1). Collectively, these markets account for more than half (52%) of the world's population—4.3 billion people—and just over 45% of the unconnected global population (1.2 billion people).¹

The scope of markets is diverse, ranging from the two most populous countries in the world, i.e., the People's Republic of China (PRC) and India, to some of the world's smallest and most geographically isolated countries. Given the heterogeneity between markets in each subregion, this report also analyzes connectivity based on the level of digitalization across markets. This leverages the clusters that are defined in the ADB Digitalization Index and the GSMA Mobile Connectivity Index (MCI), as shown in Table 2.² The analysis of countries based on their digitalization cluster is presented in Appendix 2.

Table 1: Markets Included in Study Scope, by Subregion

Central and West Asia	East Asia	Pacific developing member countries	South Asia	Southeast Asia
Afghanistan	People's Republic of China	Cook Islands	Bangladesh	Cambodia
Armenia	Mongolia	Fiji	Bhutan	Indonesia
Azerbaijan		Kiribati	India	Lao PDR
Georgia		Marshall Islands	Maldives	Malaysia
Kazakhstan		Federated States of Micronesia	Nepal	Myanmar
Kyrgyz Republic		Naoero	Sri Lanka	Philippines
Pakistan		Niue		Thailand
Tajikistan		Palau		Timor-Leste
Türkiye		Papua New Guinea		Viet Nam
Turkmenistan		Samoa		
Uzbekistan		Solomon Islands		
		Tonga		
		Tuvalu		
		Vanuatu		

Lao PDR = Lao People's Democratic Republic.

Note: These subregions are aligned with the operational definitions used by ADB.

Effective 1 February 2021, ADB placed a temporary hold on sovereign project disbursement and new contracts in Myanmar.

Source: Authors; ADB, n.d. *Where We Work*.

¹ GSMA. 2026. *State of Mobile Internet Connectivity Report 2026*.

² For further details, ADB. 2025. *Digital Development Facility for Asia and the Pacific – Phase 2: Technical Assistance Consultant's Report*; GSMA. 2025. *GSMA Mobile Connectivity Index*.

Table 2: Markets Clustered by Digitalization

Advanced	Transitioning	Emerging	Nascent
People's Republic of China	Armenia	Bangladesh	Afghanistan
Malaysia	Azerbaijan	Bhutan	Cook Islands
Türkiye	Georgia	Cambodia	Kiribati
	India	Fiji	Marshall Islands
	Indonesia	Kyrgyz Republic	Federated States of Micronesia
	Kazakhstan	Lao PDR	Naoero
	Maldives	Myanmar	Niue
	Mongolia	Nepal	Palau
	Philippines	Pakistan	Solomon Islands
	Thailand	Papua New Guinea	Timor-Leste
	Uzbekistan	Samoa	Turkmenistan
	Viet Nam	Sri Lanka	Tuvalu
		Tajikistan	
		Tonga	
		Vanuatu	

Lao PDR = Lao People's Democratic Republic.

Note: Clusters correspond to the ADB Digitalization Index with the following exceptions: Myanmar, Samoa, and Tonga, which are included in emerging markets rather than nascent markets, given their higher Mobile Connectivity Index scores than other markets in the nascent cluster. Uzbekistan is clustered as transitioning markets rather than emerging markets for the same reason.

Source: Authors.

The report is structured as follows: Chapter 2 provides an assessment of current mobile connectivity levels (see Connectivity Definitions); Chapter 3 sets out the barriers to mobile internet adoption and use; Chapter 4 presents the investment

requirements and investment gaps to achieve universal connectivity; Chapter 5 quantifies the economic benefits of achieving universal connectivity by 2030; and Chapter 6 concludes with policy recommendations to accelerate connectivity.

CONNECTIVITY DEFINITIONS

Connected

This study considers individuals that connect to the internet on a mobile device (smartphone, smart feature phone, or feature phone).^a Mobile internet services are defined as any activity that consumes mobile data (i.e., excluding short messaging, multimedia messaging, and cellular voice calls). While other devices are not in scope, the number of individuals using the internet solely on a nonmobile device (e.g., PC, laptop) is negligible based on GSMA Consumer Survey evidence.^b The definition of “connected” only includes mobile internet subscribers and users who connect through 3G, 4G, or 5G technologies.

Two categories of mobile internet usage are considered:

- *Mobile internet subscribers* are individuals who have used mobile internet on a device they own or have primary use of in the previous 3 months.
- *Additional mobile internet users* are individuals who have used mobile internet on a device they do not own or have primary use of in the previous 3 months. This is either on a shared device or a device that belongs to someone else. For internet users among the total population, this category is significant as younger children will typically access the internet on a shared device. It is possible that the estimate of additional mobile internet users includes individuals who use the internet but not on a mobile device but, as highlighted earlier, such a segment is small in proportion to the total number of mobile internet users. Estimates of this segment are based on consumer survey evidence, to avoid double counting of mobile internet subscribers.

Unconnected (not using mobile internet)

There are two ways people can be **unconnected**: either they live in an area not covered by mobile broadband or they live in an area that is covered but they do not use mobile internet.

- *Coverage gap*: those who live in an area not covered by a mobile broadband network. Mobile broadband includes 3G, 4G, and 5G technologies.
- *Usage gap*: those who live within the footprint of a mobile broadband network but do not use mobile internet services.

Population base

Two population bases are used in this report:

- *Total population*: this is used in the analysis of connectivity trends in Chapter 2.
- *Adults aged 15+*: this is used for the investment gap analysis in Chapter 4, consistent with the International Telecommunication Union’s connectivity targets.

^a Tablets are also included where they connect to a cellular network.

^b The GSMA Consumer Survey is a face-to-face, nationally representative survey carried out each year since 2017 to understand access to—and use of—mobile and mobile internet in low- and middle-income countries (LMICs). In 2025, it included more than 16,000 respondents from 14 LMICs, including five in Asia and the Pacific: Bangladesh, India, Indonesia, Pakistan, and Sri Lanka. Further details on the survey methodology are provided in the GSMA State of Mobile Internet Connectivity Reports. Across the surveyed countries, on average, fewer than 2% of respondents who had used the internet in the last 3 months did so solely on devices other than a mobile. Taking into account confidence intervals, this is not statistically significantly different from 0%.





2

State of Connectivity

More Than Two-Thirds of Developing Asia and the Pacific Are Connected, but Digital Gaps Persist

Over the past 5 years, more than 500 million people have come online in Developing APAC, increasing mobile internet penetration from 52% to 63% (Figure 1). This translates to 2.7 billion mobile internet subscribers at the end of 2025. When including individuals that access the internet on a shared device, 71% of the region's population, or 3.1 billion people, used mobile internet in 2025.

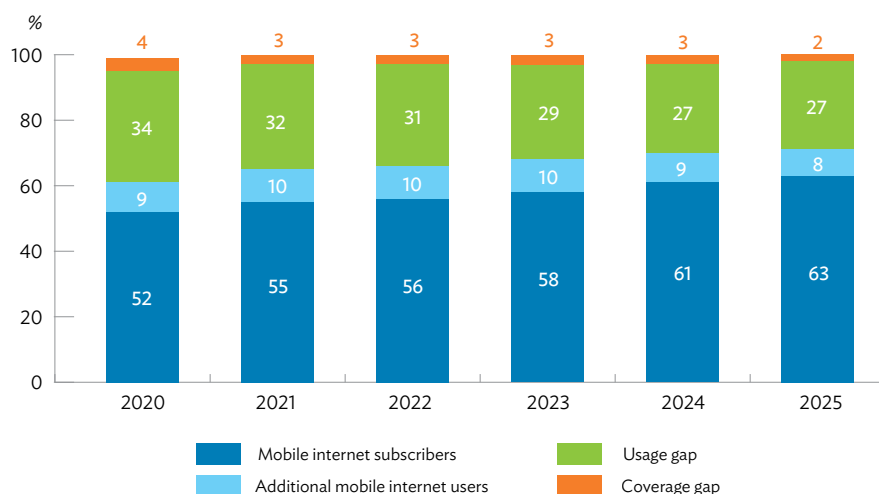
Despite this progress, significant digital divides persist within the region. When considering the unconnected population, almost 100 million people (just over 2% of the region) do not live in an area with mobile broadband coverage. These remaining uncovered communities are predominantly rural, poor, and sparsely populated and so are the most challenging to reach. Of the 4.2 billion people in the region that have mobile broadband coverage, 27% (or 1.1 billion people) do not use mobile internet. This usage gap is the main connectivity challenge in the region.

When looking at connectivity by subregion, Figure 2 reveals some stark differences. At the end of 2025,

the proportion of the population using mobile internet ranged from 93% in East Asia (mostly accounted for by the PRC) to 36% in the Pacific developing member countries. While the usage gap is the main connectivity challenge in each subregion, there remains a significant coverage gap in Central and West Asia at 11% (driven to a significant extent by Afghanistan and Pakistan) and in the Pacific developing member countries at 16% (driven to a significant extent by the largest country, Papua New Guinea). These regions contain many areas that are characterized by low demand and challenging terrain, which makes it difficult to extend coverage to the populations that live there.

When looking at the changes in mobile internet adoption since 2020, Southeast Asia stands out as by far the fastest-growing region, with mobile internet subscriber penetration increasing by almost 20 percentage points. The next subregion with the fastest connectivity growth is the Pacific developing member countries, though it began from a lower base than the other subregions.

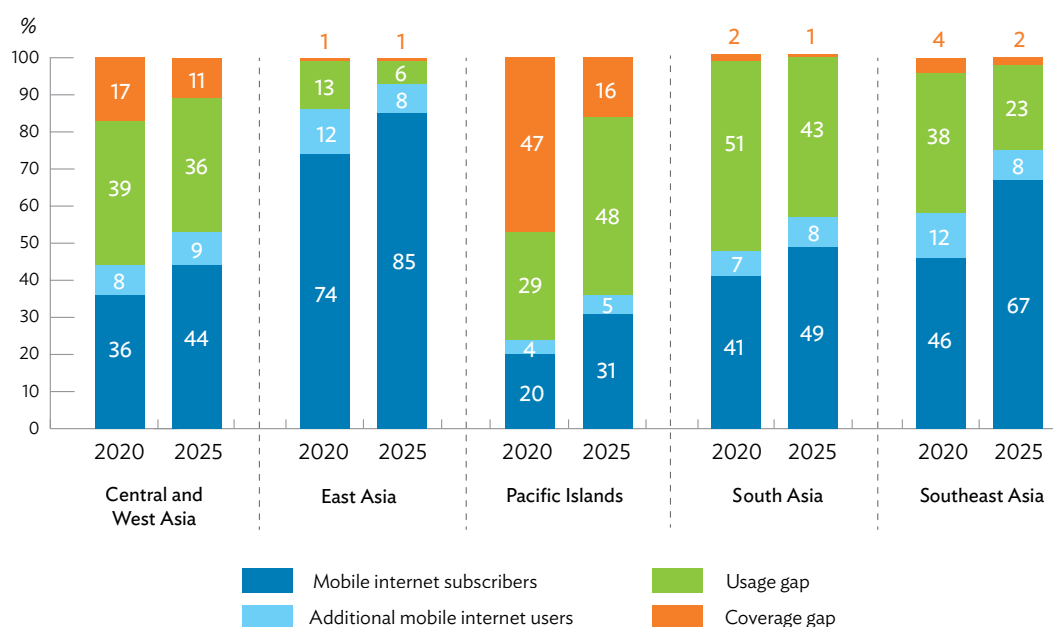
Figure 1: Mobile Internet Connectivity in Developing Asia and the Pacific, 2020–2025
(% of total population)



Note: Totals may not add up due to rounding.

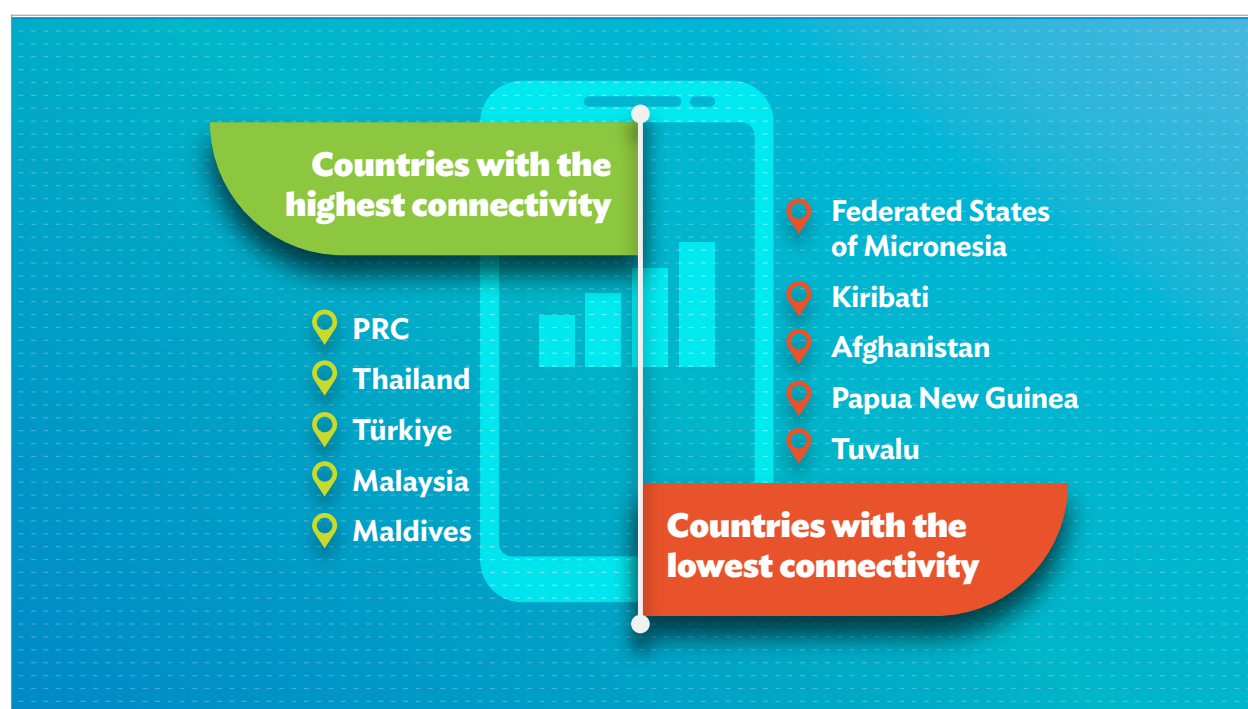
Sources: Subscriber data are sourced from [GSMA Intelligence](#) to 2025. Coverage data are sourced from [GSMA Intelligence](#), combining data reported by mobile operators and national regulatory authorities. Population data are sourced from the [United Nations](#).

Figure 2: Mobile Internet Connectivity by Subregion, 2020–2025
(% of total population)



Note: Totals may not add up due to rounding.

Sources: Subscriber data are sourced from [GSMA Intelligence](#) to 2025. Coverage data are sourced from [GSMA Intelligence](#), combining data reported by mobile operators and national regulatory authorities. Population data are sourced from the [United Nations](#).



BOX 1

Accelerating Digital Inclusion in Southeast Asia

Within the Developing Asia and the Pacific (APAC) region, and indeed globally,^a Southeast Asia stands out as achieving the highest improvements in connectivity during the past 5 years. Furthermore, it is not driven by two or three countries. Indonesia, Cambodia, the Lao People's Democratic Republic, Malaysia, Myanmar, the Philippines, Thailand, and Viet Nam have all seen mobile internet use penetration increase by 15 percentage points or more in 5 years. These improvements are also reflected in the GSMA Mobile Connectivity Index: for example, Indonesia and Viet Nam are two of the top five most improved countries globally since the index was launched.

The progress has ultimately been driven by strong improvements across all the main enablers of digital inclusion:

- **Infrastructure:** 4G network coverage was already high in 2020 at 96% and has since increased to 98%. Meanwhile, 5G coverage has expanded from 4% to almost 50% of the population, with operators in Malaysia, the Philippines, Thailand, and Viet Nam leading the 5G deployments in the region. There have also been material improvements in network quality, with average download speeds increasing fivefold from 15 megabits per second (Mbps) to 75 Mbps and average upload speeds more than doubling from 8 Mbps to 17 Mbps. These are respectively 77% and 44% higher than the averages across low- and middle-income countries globally. The improvements have been driven by a combination of 5G deployments as well as improvements to 4G networks, along with consumers migrating from 3G to the newer technologies. This has enabled a significant increase in data usage, from an average of 5 gigabytes (GB) per connection in 2020 to 13 GB per connection in 2025, with Malaysia and Thailand among the top 10 highest mobile consumption countries worldwide.
- **Affordability:** The average cost of a 1 GB data plan as a proportion of monthly gross national income (GNI) per capita in Southeast Asia declined from 1.5% to 0.9% between 2020 and 2025, and it fell from 3.2% to 2.3% for a 5 GB plan.^b The cost of 5 GB plans are now below the International Telecommunication Union, affordability target of 2% of monthly GNI per capita^c in all Southeast Asian countries apart from Myanmar and Timor-Leste. With the exception of the latter two countries and Cambodia, an entry-level device costs 20% of monthly GNI per capita (which is the threshold for an affordable device) or less.^d A key challenge going forward is to address affordability barriers for the poorest population segments. On average in Southeast Asia, when considering the poorest 40% of the population in each country, a 5 GB mobile plan costs around 5% of monthly income (above the International Telecommunication Unit affordability target) and an entry-level device costs more than 70% of monthly income (well above the 20% affordability threshold for devices).
- **Consumer readiness:** Mobile ownership^e in the region has increased from 65% in 2020 to 76% in 2025, while the gender gap in mobile ownership (4%) and mobile internet (7%) is lower than all other subregions apart from East Asia.
- **Content and services:** There has been a significant increase in the development of local content. The proportion of mobile applications developed in the nine low- and middle-income countries in Southeast Asia increased by 50% in the past decade (from 2% to 3%), while over the same period there has been on average a threefold increase in the number of apps accessible in local languages (e.g. in Vietnamese, Bahasa Indonesia, Filipino, Khmer, and Malay). This is reflected in a 15% increase in the region's average Digital Language Support score, which assesses the aggregated digital capabilities for all languages in each country, based on the availability and accessibility of language-specific hardware and

continued on next page

Box 1 continued

software support.^f In addition, many Southeast Asian markets have seen greater digitalization of public service delivery, including e-services, which has helped to bring more people online.

This highlights how the enablers of digital inclusion are linked to each other. As more individuals acquire internet-enabled handsets and as the internet becomes more relevant, consumers will be more willing and able to use the internet, which will in turn drive more competitive and innovative markets and incentivize operators to expand coverage.

It is also important to emphasize the policy reforms that many governments and regulators in the region have undertaken to accelerate mobile internet use and the adoption of new technologies. For example, Malaysia launched its National Digital Network Plan (Jendela) in 2020, with the objective to accelerate nationwide broadband infrastructure development, achieve near-universal connectivity in populated areas, improve network quality, phase out legacy technologies, expand 4G to highways and transport corridors, and lay the groundwork for 5G rollout. The program contributed to improved infrastructure and adoption by simplifying approvals, aligning federal and state regulations, implementing a six-way multiple operator core network to enable passive and active infrastructure sharing, and providing public funding for underserved regions. More recently, the government granted a second 5G license, reversing its initial decision to implement a 5G single wholesale network, opting instead for a dual-network model.^g The Malaysian government also launched the National AI Office to drive investment, innovation and collaboration in the AI space as part of the country's ambition to become a digital nation.

Another example is Viet Nam and its approach to spectrum management. Following the failure of the 2023 spectrum auction for 2.3 gigahertz (GHz), the Vietnamese government reduced the reserve prices by up to 90% and subsequently assigned the 2.6 GHz, 3.5 GHz, and 700 megahertz bands, more than doubling mobile spectrum and unlocking 5G rollout. The government also reinvested auction revenues into national connectivity goals, including subsidies that cover up to 15% of 5G base station costs for operators that meet rollout targets. This creates a circular system in which public revenues directly fund public outcomes, ensuring that spectrum decisions translate into improved network quality and coverage. This contributed to Viet Nam achieving one of the world's fastest 5G rollouts, reaching 90% coverage within a year of launching.

^a For example, GSMA (n.d.).

^b In order to produce comparable price metrics across countries, we define two baskets based on usage allowance (1 GB and 5 GB). We research all tariffs offered by operators in each country and select the cheapest available plan under which the basket requirements could be met. Further details on the data and methodology can be found in GSMA (2025a).

^c GNI per capita is used to provide a comparable and consistent proxy for income across countries over time. However, it may not fully reflect household-level affordability constraints, particularly for low-income or informal sector populations.

^d Further details on how this threshold was developed can be found in GSMA (2024).

^e This is defined as the proportion of total population that owns or has primary use of a device with a mobile subscription (including voice and short messaging, but not always the use of data).

^f For further details, see Derivation (n.d.a); Derivation (n.d.b); Simons et al. (2022).

^g For further details, see GSMA Intelligence (2025b).

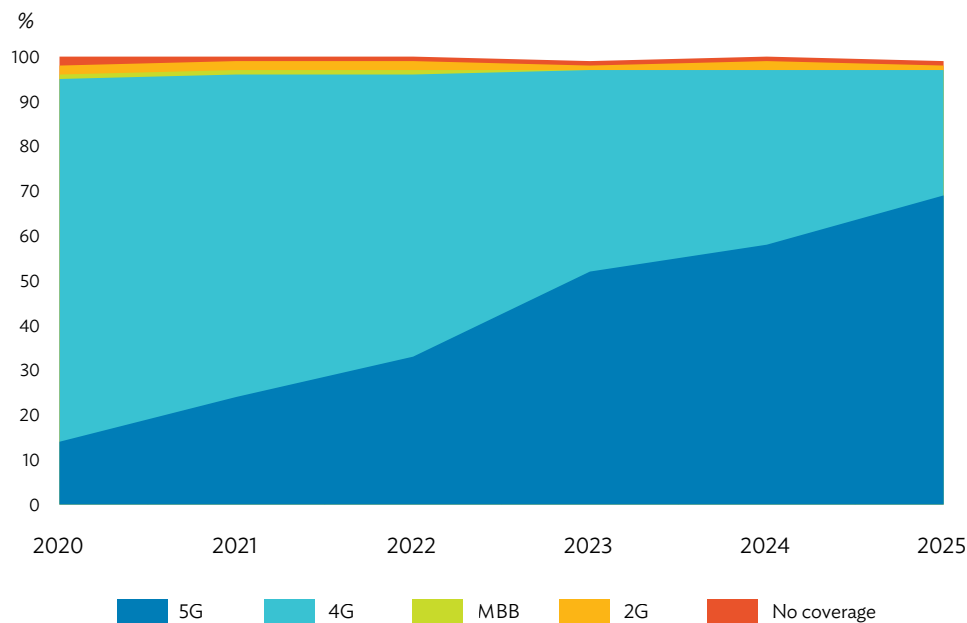
Sources: GSMA. 2025a. *Mobile Connectivity Index Methodology*; GSMA Intelligence. 2025b. *5G and the Tech Economy in Malaysia: Tapping the Untapped*; GSMA. n.d. *State of Mobile Internet Connectivity Report 2025*; GSMA. 2024. *Analysis to Improve Handset Affordability*; Derivation. n.d.a. *Digital Language Support*; Derivation. n.d.b. *Understand the Global Digital Language Divide, Easily and Efficiently*; Simons et al. 2022. *Assessing Digital Language Support on a Global Scale*

4G and 5G Are Now the Predominant Technologies in Developing Asia and the Pacific, but the Use of Feature Phones and 3G Remains Significant

During the last 5 years, the focus of mobile operators in terms of network coverage has been the deployment of 5G networks, which has increased from 14% to 69% of the population (Figure 3). Figure 4 shows this has been driven in large part by East Asia (mostly the PRC) and South Asia (mostly India). 4G networks were already widespread in 2020, covering 95% of the population, and have since increased to 98%.

During this period, many operators have also either shut down or begun the process of sunsetting legacy 2G and/or 3G networks, which is why 3G population coverage is lower than 4G in East Asia and Southeast Asia (Figure 4). These shutdowns are driven by declining traffic on legacy generation networks, the financial burden of maintaining legacy infrastructure, the ongoing shift to open, cloud-native, artificial intelligence (AI)-native networks, and the need to use spectrum resources efficiently by migrating to newer technologies.

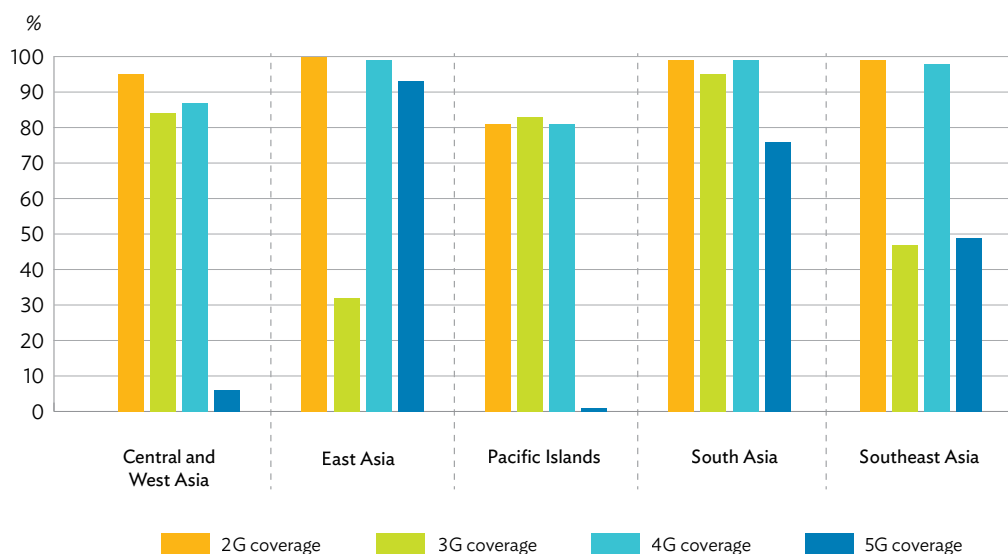
Figure 3: Developing Asia and the Pacific Population Coverage by Technology, 2020–2025



MBB = mobile broadband.

Note: In markets that have shut down their 3G networks or are in the process of sunsetting 3G, 4G coverage is greater, so MBB coverage (the maximum of 3G, 4G, or 5G coverage) is used as the reference when considering the gap with 4G.

Source: [GSMA Intelligence](#).

Figure 4: Population Coverage by Technology in Each Subregion, 2025

Source: GSMA Intelligence.

Countries with the highest 5G population coverage

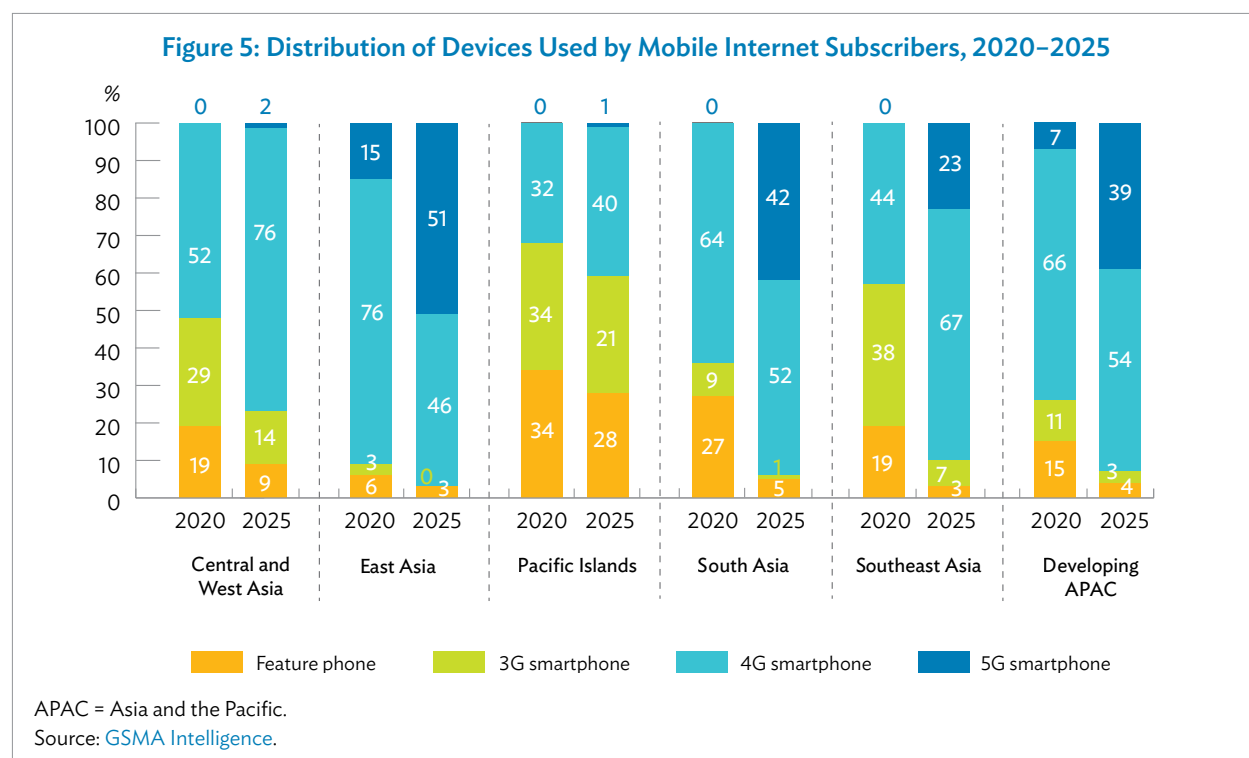
- Philippines
- Thailand
- Armenia
- PRC
- Viet Nam

- Afghanistan
- Papua New Guinea
- Marshall Islands
- Pakistan
- Turkmenistan

Countries with the largest mobile broadband coverage gaps

Reflecting the high level of 4G and 5G coverage, Figure 5 shows that the majority (93%) of mobile internet users in Developing APAC connect using either a 4G or 5G smartphone, with significant growth in 5G adoption during the past 5 years. This is driven by a combination of internet users migrating from feature phones and 3G smartphones to 4G or 5G, as well as new users (that were previously not using mobile internet) connecting straight to newer technologies. However, within the region, around 180 million mobile internet subscribers are using a feature phone or 3G smartphone, which translates

to 7% of the subscriber base. This is notably higher in Central and West Asia (at 23%) and especially in the Pacific developing member countries (at 59%). This significant 3G user base is important, as the investment gap analysis must account not only for connecting new users but also for migrating users of feature phones or 3G smartphones onto 4G-capable devices. The technology divide also has a significant impact on usage, as countries where more than 90% of mobile internet users are on 4G or 5G have 50% higher data usage per mobile user than those with lower 4G/5G adoption.

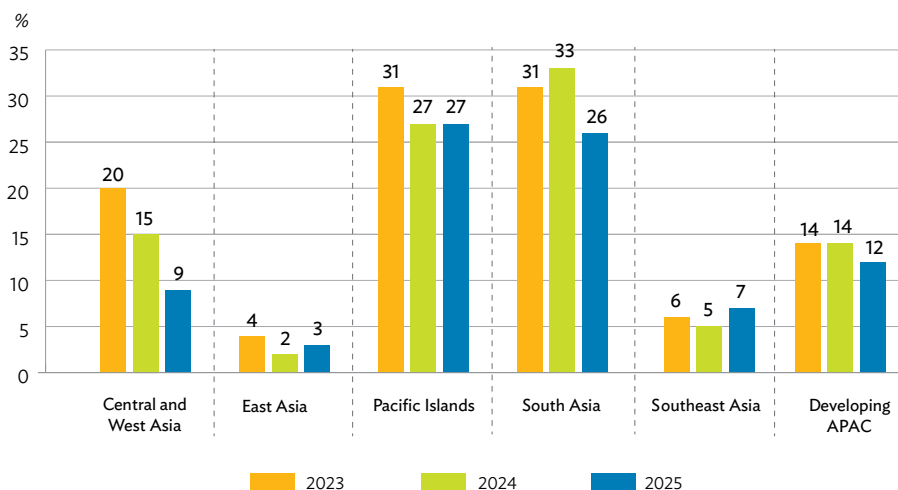


Significant Digital Divides Persist Within Countries by Gender, Geography, and Disability

In addition to digital divides between regions, there are also connectivity gaps within regions and countries. Figure 6 shows that the overall gender gap in Developing APAC stood at 12% in 2025, meaning that women were 12% less likely to use mobile internet than men. There are again significant differences by

subregion, with the largest gender gaps in the Pacific developing member countries and South Asia at just over 25%. East Asia and Southeast Asia have seen better progress in reducing the gender gap, standing at 3% and 7%, respectively, in 2025.

Figure 6: Gender Gap in Mobile Internet Adoption, 2023–2025



APAC = Asia and the Pacific.

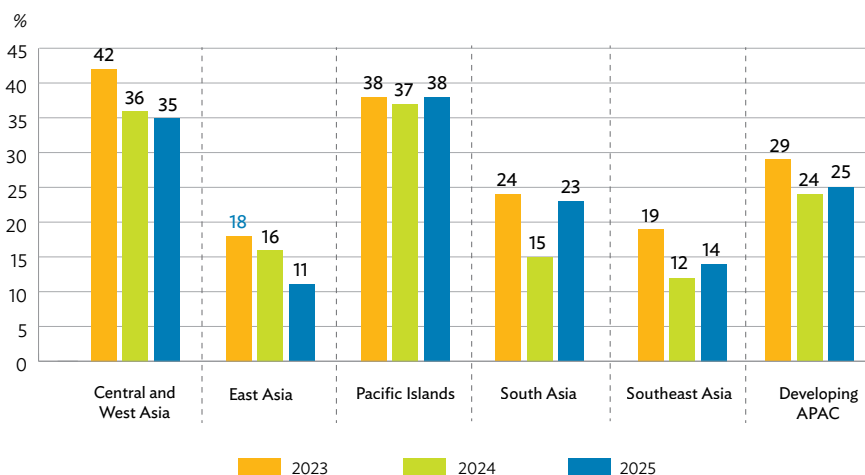
Note: The gender gap is calculated as the percentage adoption of male subscribers minus the percentage adoption of female subscribers and then divided by the percentage adoption of male subscribers.

Source: GSMA Intelligence analysis of modeling. GSMA. 2026. [Mobile Gender Gap Report 2026](#).

Figure 7 also shows a significant rural–urban gap in Developing APAC, with rural populations being 25% less likely to use mobile internet than urban populations. This declined from 29% in 2023,

with progress in Central and West Asia, East Asia, and Southeast Asia. The largest rural–urban gap is in the Pacific developing member countries at 38%.

Figure 7: Rural–Urban Gap in Mobile Internet Adoption, 2023–2025



APAC = Asia and the Pacific.

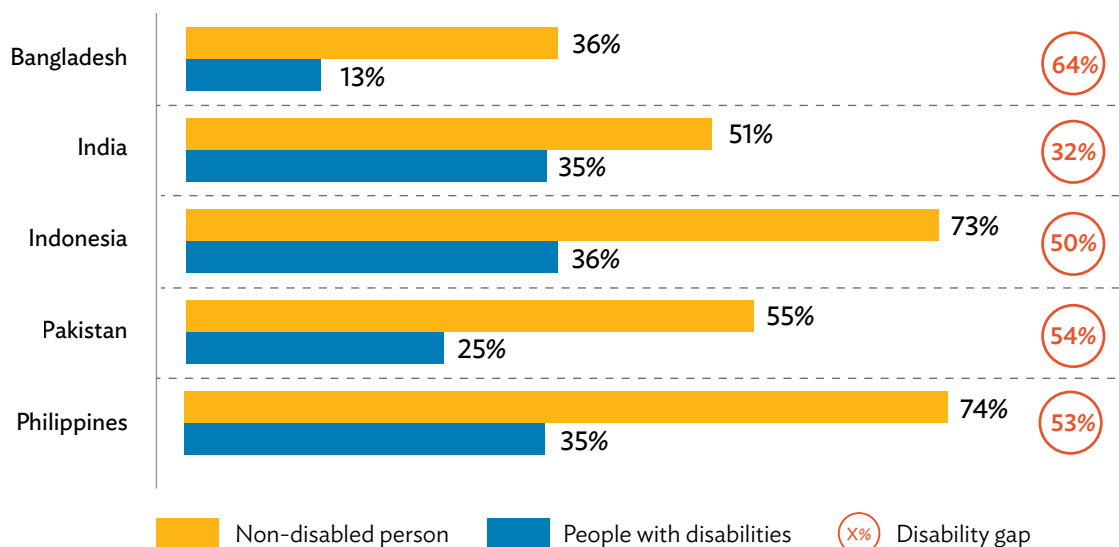
Note: The rural–urban gap is calculated as the percentage adoption of urban subscribers minus the percentage adoption of rural subscribers and then divided by the percentage adoption of urban subscribers.

Source: GSMA Intelligence analysis of modeling. GSMA. 2026. [State of Mobile Internet Connectivity Report 2026](#).

While there are no regional-level data on disability gaps in mobile internet adoption, GSMA consumer evidence shows that, in the five surveyed Developing APAC countries, people with disabilities are significantly less likely to use mobile internet than nondisabled people. This is consistent with global patterns: accessibility barriers, both in device design and in digital services, disproportionately affect people with visual, hearing, cognitive, or physical impairments. While comprehensive regional data is limited, the survey results suggest the disability gap is a material inclusion challenge that policy frameworks must specifically address.

In addition to digital inclusion gaps by gender, geography, and disability, there are other population segments that may be underserved in certain markets, such as older people, informal workers, migrants, and crisis-affected populations (for example, refugees and displaced persons). The adoption of connectivity by micro, small, and medium-sized enterprises is also critical to increase the formalization and productivity of businesses. While there are insufficient data to quantify these in the region, it is important for governments and the private sector to identify such gaps in each market to determine the best way of closing them.

Figure 8: Disability Gaps in Mobile Internet Adoption, 2024



Source: GSMA. 2025c. [The Mobile Disability Gap Report 2025](#).

Connectivity and Digital Transformation

For all countries in Developing APAC, achieving universal connectivity is ultimately one part (albeit a critical one) of becoming a digital nation, which is underpinned by innovation, data governance, security, and people, as well as infrastructure. Digitalization continues to be a top priority for nations seeking to drive economic growth and foster inclusive,

resilient societies. Governments increasingly rely on digitalization to boost productivity, drive innovation, and enhance national competitiveness amid shifting demographics and growing geopolitical uncertainties. Furthermore, in addition to enabling digital services such as e-government, digital payments, and online

platforms, connectivity has become a foundation of AI readiness, and digital public infrastructure (DPI).³

The importance of connectivity is highlighted by the fact that countries that have made the most progress on becoming digital nations (as well as achieving more mature DPI), such as the PRC, Malaysia,

and Thailand, are also those with the greatest use of 4G and 5G connectivity.⁴ On the other side, countries with the lowest levels of connectivity are typically at the emerging stages of becoming a digital nation. The wider economic benefits of connectivity and digitalization are analyzed in Chapter 5.

³ DPI refers to foundational digital systems that enable the delivery of integrated, inclusive, secure, and scalable public and private services at a national or population scale. These include digital identity, payments, and data-sharing platforms.

⁴ For more information on countries' progress to being digital nations, see GSMA. 2025d. *Digital Nations 2025: Sustaining Progress in Asia and the Pacific through Investment*. Further data on DPI maturity can be found at *The Digital Public Information Map*.





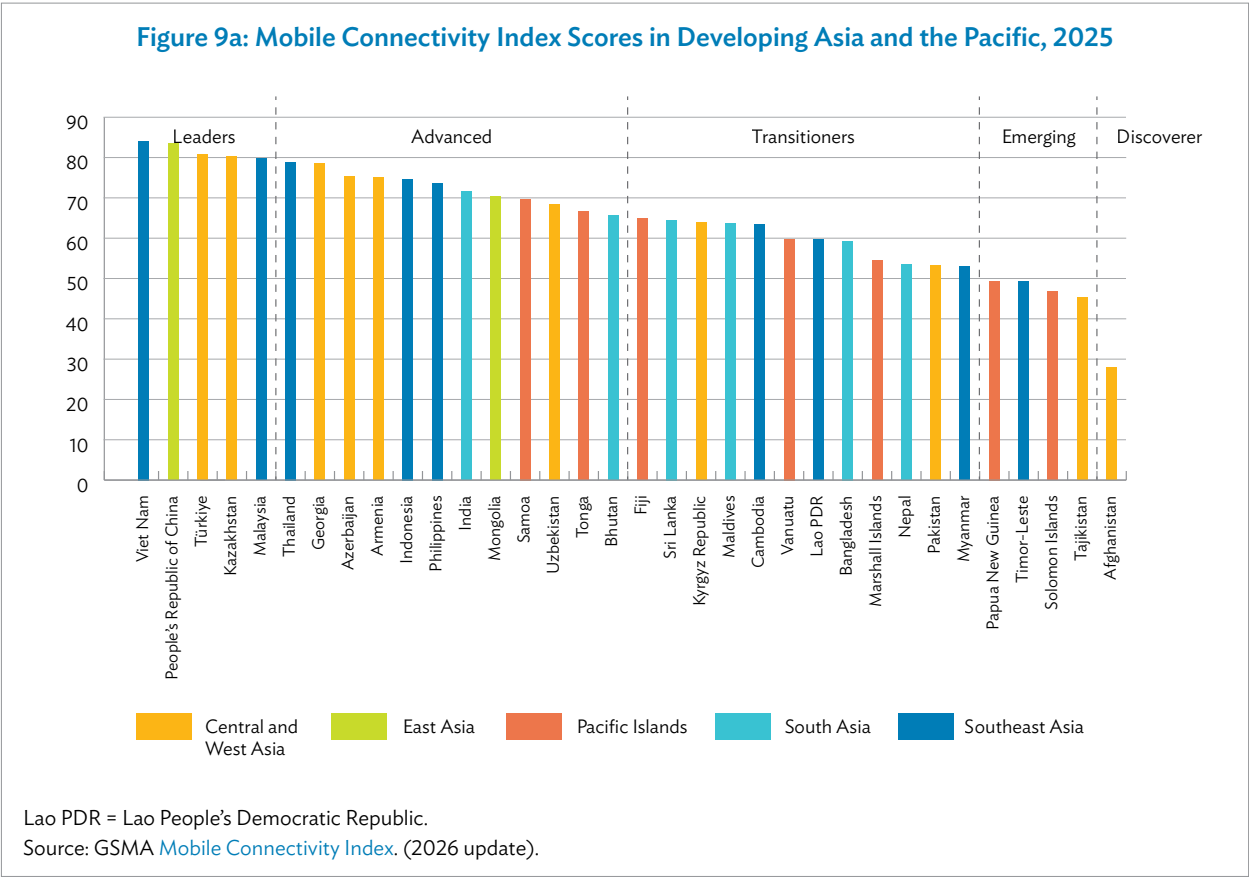
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Barriers to Connectivity

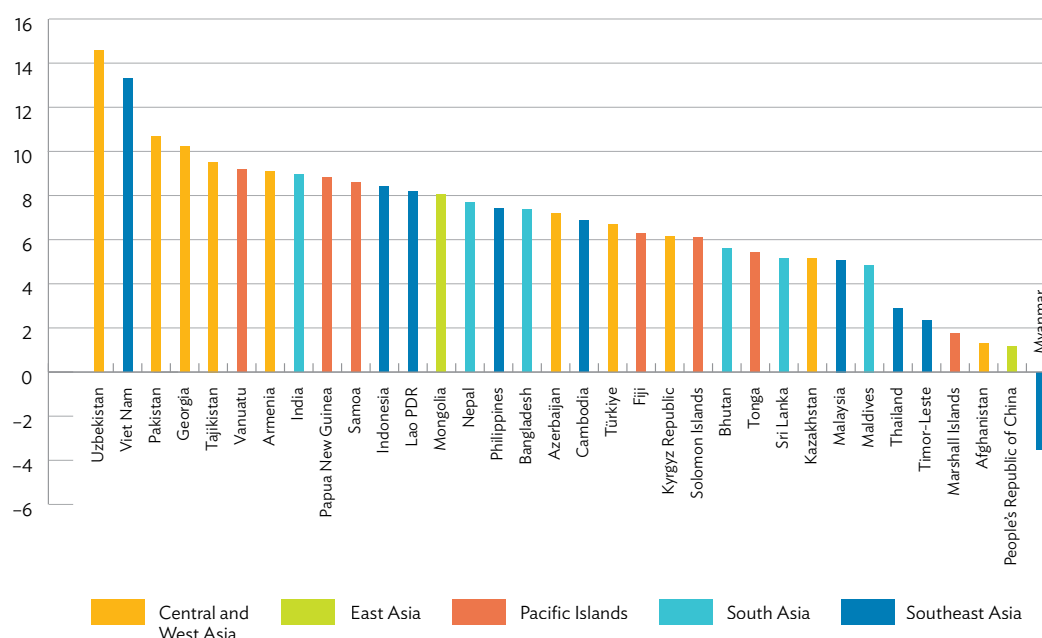
The GSMA Mobile Connectivity Index Highlights the Key Barriers by Subregion and Country

Understanding the barriers to mobile internet adoption and further use is key to tackling the usage gap and ensuring more inclusive digital connectivity in the Developing APAC region. The GSMA MCI quantifies the four key enablers of mobile internet adoption: infrastructure, affordability, consumer readiness, and content and services.⁵ Figure 9a shows the overall scores for each country included in the MCI, while Figure 9b shows the increase in scores

over 5 years. The countries achieving the biggest improvements have also seen some of the biggest increases in mobile internet adoption, notably in Southeast Asia and the Pacific developing member countries. Some of the high-growth markets, for example Malaysia and Thailand, already have strong performance 5 years ago and so had the foundations to drive greater adoption.



⁵ GSMA. 2025. [GSMA Mobile Connectivity Index](#).

Figure 9b: Increase in Mobile Connectivity Index Scores in Developing Asia and the Pacific, 2020–2025

Lao PDR = Lao People's Democratic Republic.

Source: [GSMA Mobile Connectivity Index](#). (2026 update).

Analysis of the MCI by enablers highlights the most significant barriers in each subregion, as shown in Figure 10. Central and West Asia lags the regional average in each enabler, with its lowest scores being in affordability and consumer readiness. The Pacific developing member countries also lag the regional average, with the lowest score and biggest gap around content and services, reflecting a lower level of content creation as well as less content available in local languages. The latter is a particular challenge

in linguistically diverse countries such as Papua New Guinea.

In South Asia, the MCI scores are generally close to the Developing APAC average, with the notable exception of consumer readiness, which is driven by a much higher gender gap and lower skills, and to a lesser extent on content and services. Southeast Asia generally performs well on the MCI compared to other Developing APAC countries, given its improvements over the past 5 years.

Figure 10: Mobile Connectivity Index Enabler Scores by Region Compared to Developing Asia and the Pacific, 2025



APAC = Asia and the Pacific.

Note: East Asia is not included as it is dominated by the People's Republic of China, which is a leading Mobile Connectivity Index country in Developing APAC.

Source: [GSMA Mobile Connectivity Index](#) (2026 update).

BOX 2

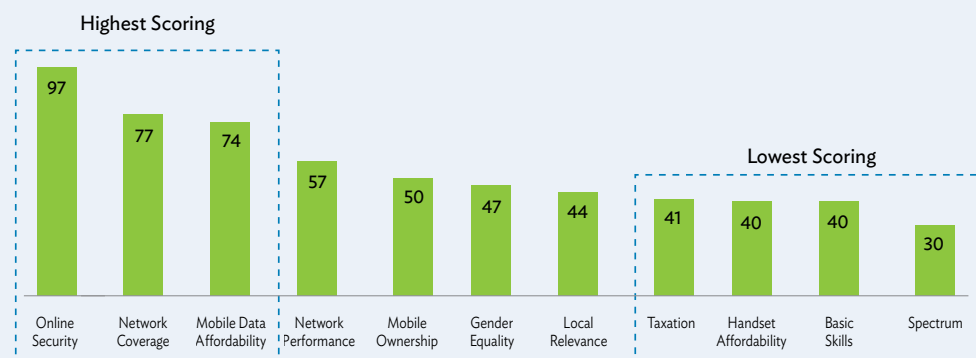
How to Use the Mobile Connectivity Index as a Diagnostic Tool—The Example of Pakistan

The Mobile Connectivity Index (MCI) can serve as a diagnostic tool to identify the key barriers to mobile internet adoption by country, which can then be used to identify policy reforms and interventions by international organizations. Taking the example of Pakistan, which emerged as the most improved country in the Asia and Pacific region on the MCI in 2025. The Figure presents the 2025 scores across the Index's 11 dimensions (these dimensions are aggregated to construct the four enabler scores). The Pakistan government has undertaken significant and strategic development of its cybersecurity frameworks, positioning digital trust as a core pillar of its digital transformation agenda. This is reflected in the high online security score. At the same time, operators have made good progress on expanding network coverage and mobile data affordability. The latter is reflected in the fact that the cost (in United States [US] dollars) of accessing 1 gigabyte of monthly data was the lowest globally, demonstrating the sector's commitment to affordability and inclusion.^a

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Box 2 continued

Figure: Pakistan Mobile Connectivity Index Dimension Scores, 2025



The key priority areas for further acceleration (at the end of 2025) are on taxation, spectrum, skills, and handset affordability. By identifying the biggest bottlenecks to adoption, the MCI can focus the efforts of governments, mobile operators, investors, and the broader digital ecosystem. Taking each of the four low-scoring dimensions in turn:

- Spectrum:** At the end of 2025, the amount of spectrum assigned for mobile services in Pakistan was among the lowest in Developing Asia and the Pacific, yet it also had one of the highest spectrum costs as a proportion of mobile revenues. The reasons for this included high reserve prices, spectrum scarcity and the depreciation of the Pakistani rupee against the US dollar since 2017, as spectrum fees were in US dollars rather than the local currency. This makes it challenging for operators to invest in new technologies as well as expand coverage. Furthermore, the lack of spectrum has a direct impact on the coverage and quality of mobile networks. In March 2026, the Government of Pakistan took significant steps to address this by assigning 480 megahertz of new spectrum across four bands, increasing the country's total assigned spectrum almost threefold. This will address Pakistan's low MCI Spectrum score and ultimately contribute to greater network quality and coverage. Spectrum fees were also denominated in rupees and reserve prices were set more conservatively than before (with a reduction of around 90%), supporting sustainable long-term investment with phased rollout obligations.
- Basic skills:** Pakistan's low score on this dimension is driven by a low adult literacy rate of 63% as well as a school life expectancy of 8 years, which means a significant proportion of the population will lack the skills needed to effectively use digital technologies. It is therefore important for operators, governments, and stakeholders such as the Asian Development Bank to raise awareness and invest in diverse training methods to ensure broad participation among the underserved and to identify specific target groups and promote inclusive, lifelong learning through education policies and accessible delivery channels.
- Handset affordability:** Mobile operators, Pakistan's government and regulator, and the wider mobile and device ecosystem have taken significant steps to improve handset affordability in recent years, with smart feature phones (such as the Jazz Digit) available for \$20–\$30. However, such prices can still be prohibitive for the poorest population segments. This highlights the importance of developing and supporting device financing schemes for consumers that cannot afford a one-off cost and, where appropriate, supporting device-subsidy programs.
- Taxation:** Pakistan's low score is driven by the cost of sector-specific taxes on mobile usage, in particular the 15% advance income tax (or withholding tax) on mobile services. This creates additional barriers to digital inclusion for households with very low income. Removing the tax would enhance affordability further and align mobile sector taxation levels with the rest of the economy, providing greater investment incentives.

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Box 2 continued

In terms of Pakistan's progress on the MCI, the improvements seen in the gender gap warrant a particular mention. Pakistan has made notable progress in reducing the mobile internet gender gap to 8% at the end of 2025, down from 43% in 2020 and 71% in 2018, reflecting growing momentum in digital inclusion efforts. Women face similar barriers to men in adopting mobile internet but are affected more acutely, including in terms of affordability and skills. There are also barriers related to social norms that restrict women from using the internet on a device of their own, as highlighted in GSMA Consumer Survey evidence. The Pakistan Telecommunication Authority, supported by the GSMA, has been proactive in its aim to address the gender gap, launching a Digital Gender Inclusion Strategy in 2024 in partnership with UNESCO. At the same time, mobile operators have made continued commitments to increase the proportion of women in their mobile internet customer base as part of the GSMA Connected Women Commitment Initiative. Going forward, it will be important to scale these initiatives to address affordability (for example, by considering subsidy programs), social norms (for example, through awareness-raising campaigns that focus on socially acceptable benefits of mobile internet such as helping families become more financially resilient), and digital skills (for example, through digital skills training programs targeting women).

^a GSMA analysis of mobile pricing data sourced from Tarifica. This is consistent with Pakistan having the third-lowest average revenue per user globally.

Sources: GSMA. 2021. *Using the GSMA Mobile Connectivity Index to Drive Digital Inclusion: Guidelines for Policymakers*; GSMA. 2025. *Building Digital Pakistan through Effective Spectrum Policy*; GSMA. 2025. *Global Spectrum Pricing*; Pakistan Telecommunication Authority (PTA). 2026. *PTA Successfully Concludes Assignment Stage of NGMS / 5G Spectrum Auction*; PTA and UNESCO. 2024. *Digital Gender Inclusion Strategy*.

In addition to the MCI, there are other complementary information and communication technology (ICT) indices and benchmarks that can be used to better understand institutional and governance-related constraints, such as regulatory coordination and digital ecosystem development. These include the International Telecommunication

Union (ITU) G5 Regulatory Benchmark and ICT Regulatory Tracker,⁶ the ADB Digitalization Index,⁷ and the GSMA Digital Nations Index. Combining insights from these tools can help ensure that policy discussions capture system-level challenges alongside consumer-level barriers.

Consumers Report Digital Skills and Affordability as the Main Barriers to Adoption, While Safety and Security Concerns Can Inhibit Meaningful Use

The GSMA conducts a consumer survey in a selection of markets each year, including a set of questions on the barriers to mobile internet adoption, which are asked to those who are aware of mobile internet⁸ but are not using it. Table 3a reports these by country,

including the six markets that were surveyed in Developing APAC (Bangladesh, India, Indonesia, Pakistan, the Philippines, and Sri Lanka). Compared to other regions, literacy and skills is reported as the most significant barrier among Developing APAC markets,

⁶ ITU. n.d. *G5 Benchmark*; ITU. n.d. *ICT Regulatory Tracker* (accessed 16 June 2026).

⁷ For further details, see ADB. 2020. *Digital Development Facility for Asia and the Pacific – Phase 2: Technical Assistance Consultant's Report*; ADB. 2025. *Digital Development Facility for Asia and the Pacific – Phase 2: The Asian Development Bank Digitalization Index: Final Index Results*.

⁸ In the surveyed Asia and the Pacific markets, between 68% and 87% of respondents were aware that the internet could be accessed on a mobile device. In most surveyed countries, more than 80% of the population were aware of mobile internet.

followed by affordability and safety and security concerns (the importance of these inevitably varies depending on the country). Coverage is not reported as a significant barrier, which is consistent with the high level of 4G coverage in most countries.

In terms of digital skills and literacy, while the barriers to adoption are particularly focused on basic skills, it is also necessary for a country's adult population to have the intermediate and advanced digital skills that are necessary to build digital economies and strengthen institutional capabilities. This is reflected in the investment gap analysis in Chapter 4.⁹

The survey also asks, for existing mobile internet users, what prevents them from using the internet more than they would like. Here, safety and security become much more significant concerns, particularly scams and fraud, while inconsistent coverage and slow connection speeds are also challenges (particularly in rural areas). The barriers related to safety and security highlight the importance of trust as a broader enabler of digital adoption, including cybersecurity, data protection, and user confidence in digital platforms. Chapter 6 provides recommendations on how these dimensions can be strengthened to build safe and trusted digital ecosystems.

Another barrier to mobile internet use going forward is likely to be around services and language. While the latest survey evidence does not highlight this as a top barrier, digital services are becoming increasingly AI-enabled. However, the digital world is dominated

by a small number of “high-resource” languages that are well represented in AI systems, particularly English and other Latin script languages. This contrasts with “low-resource” languages that have limited or no representation in AI research, datasets, and digital products. These languages often lack sufficient text or speech data, evaluation benchmarks and other computational resources. In some cases, existing materials may be fragmented, inaccessible, or in unusable formats. GSMA analysis on the AI language gap (i.e., the gap between high-resource and low-resource languages) shows that AI systems are heavily concentrated in a small number of high-resource languages, creating a performance and accessibility gap in markets where low-resource languages dominate. This limits the relevance, usability and trust of AI-enabled services.¹⁰

In Developing APAC, the MCI shows that digital language support lags significantly behind North and South America, as well as Europe.¹¹ This makes it important for digital services to be accessible, relevant, and trusted in local linguistic and cultural contexts. Fortunately, new AI-driven technologies also have the potential to close the digital language divide, for example, through the use of natural language processing and machine translation to bring more minority and indigenous languages online. While these technologies remain in their early stages, they could offer an important means to bridge the gap between digitally established languages and those that have been left behind.

⁹ More details on the definition of basic and advanced digital skills are provided in Appendix 2.

¹⁰ GSMA. 2026. [Bridging the Language Gap](#).

¹¹ Mobile Connectivity Index and GSMA. 2023. [State of Mobile Internet Connectivity Report 2023](#).

Table 3a: Top Reported Barriers to Mobile Internet Adoption, 2025

COUNTRY	AFFORDABILITY		LITERACY AND DIGITAL SKILLS			RELEVANCE		SAFETY AND SECURITY					FUNDAMENTAL ENABLERS							
	Handset cost	Data cost	Reading/writing difficulties	Difficulties using a mobile in general	Not confident using mobile internet	Not sufficient support in learning to use the internet	Internet is not relevant for me	Insufficient content in local language	Strangers contacting me	Harmful content (self/family)	Information security	Do not trust information on websites or apps	Scams or fraud	Inconsistent/no coverage	Slow connection speeds	Internet drains my battery	Access to agent support	Do not have time to use mobile internet	Shared phone access	Family does not approve
Egypt	35%	6%	16%	10%	1%	1%	8%	1%	3%	2%	0%	1%	1%	1%	1%	3%	2%	4%	1%	1%
Ethiopia	44%	5%	22%	3%	5%	1%	4%	1%	2%	1%	1%	0%	1%	4%	1%	1%	1%	4%	0%	0%
Ghana	33%	4%	17%	1%	5%	2%	3%	0%	2%	3%	3%	1%	5%	2%	2%	3%	0%	11%	1%	2%
Kenya	54%	4%	9%	2%	4%	1%	4%	2%	1%	1%	2%	1%	2%	1%	1%	3%	0%	4%	2%	2%
Nigeria	36%	7%	26%	2%	4%	0%	4%	1%	2%	1%	2%	1%	3%	2%	0%	1%	1%	2%	3%	3%
Senegal	35%	3%	17%	3%	5%	1%	3%	0%	2%	4%	1%	1%	5%	3%	1%	5%	1%	5%	4%	1%
Uganda	51%	5%	8%	1%	3%	3%	4%	0%	1%	2%	1%	1%	2%	8%	0%	1%	2%	4%	3%	1%
Bangladesh	10%	6%	26%	7%	3%	2%	5%	6%	0%	5%	0%	1%	2%	0%	2%	5%	0%	8%	5%	7%
India	8%	7%	17%	2%	5%	6%	6%	3%	3%	3%	5%	1%	9%	2%	3%	2%	2%	3%	5%	4%
Indonesia	10%	9%	10%	3%	6%	0%	4%	1%	4%	3%	7%	1%	12%	8%	9%	0%	1%	3%	3%	7%
Pakistan	13%	5%	32%	2%	3%	3%	8%	2%	1%	3%	3%	1%	2%	2%	2%	2%	0%	5%	1%	10%
Philippines	7%	3%	5%	3%	5%	3%	3%	1%	7%	2%	16%	7%	23%	1%	1%	5%	4%	5%	1%	1%
Sri Lanka	9%	19%	8%	3%	13%	2%	15%	0%	2%	9%	0%	0%	2%	8%	2%	0%	1%	4%	0%	1%
Guatemala	11%	6%	22%	7%	4%	3%	1%	1%	9%	5%	4%	2%	7%	11%	1%	1%	1%	3%	1%	0%
Mexico	17%	3%	9%	6%	11%	8%	4%	0%	1%	2%	15%	1%	11%	4%	1%	0%	0%	3%	4%	1%
Base: Adults aged 18+ who have not used mobile internet, despite being aware of mobile internet (excludes those who are not aware of mobile internet). Percentages indicate the proportion of respondents who answered. “This is the most important reason stopping me” to the question, “Which one of those factors would you say is the single most important reason stopping you from using the internet on a mobile phone?” Source: GSMA Consumer Survey, 2025 apart from the Philippines which is based on GSMA Consumer Survey, 2024.																				
Least frequently cited barrier in that country															Most frequently cited barrier in that country					

Base: Adults aged 18+ who have not used mobile internet, despite being aware of mobile internet (excludes those who are not aware of mobile internet). Percentages indicate the proportion of respondents who answered, "This is the most important reason stopping me" to the question, "Which one of those factors would you say is the single most important reason stopping you from using the internet on a mobile phone?"

Source: GSMA Consumer Survey, 2025 apart from the Philippines which is based on GSMA Consumer Survey, 2024.



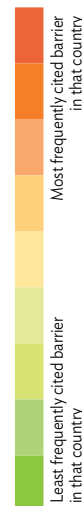
Table 3b: Top Reported Barriers to Further Mobile Internet Use, 2025

COUNTRY	AFFORDABILITY		LITERACY AND DIGITAL SKILLS			RELEVANCE		SAFETY AND SECURITY				FUNDAMENTAL ENABLERS										
	Handset cost	Data cost	Reading/writing difficulties	Difficulties using a mobile in general	Not confident using mobile internet	Not sufficient support in learning to use the internet	Internet is not relevant for me	Insufficient content in local language	Strangers contacting me	Harmful content (self/family)	Information security	Do not trust information on websites or apps	Scams or fraud	Inconsistent/no coverage	Slow connection speeds	Internet drains my battery	Access to agent support	Do not have time to use mobile internet	Shared phone access	Family does not approve	Only allowed to use mobile internet for a limited amount of time or at certain times of the day	Only allowed to use mobile internet for specific reasons
Egypt	4%	8%	6%	3%	2%	4%	5%	1%	4%	5%	8%	4%	5%	14%	7%	7%	1%	4%	1%	3%	2%	2%
Ethiopia	24%	17%	3%	1%	0%	2%	1%	0%	2%	2%	2%	2%	1%	17%	9%	4%	1%	6%	3%	2%	0%	0%
Ghana	7%	26%	4%	1%	1%	1%	0%	1%	6%	4%	5%	2%	11%	11%	4%	7%	2%	4%	1%	1%	1%	1%
Kenya	12%	29%	1%	0%	0%	0%	0%	1%	4%	3%	4%	2%	6%	8%	4%	11%	1%	6%	4%	0%	2%	2%
Nigeria	5%	44%	9%	0%	1%	1%	1%	2%	4%	2%	2%	2%	5%	8%	3%	6%	1%	2%	1%	0%	1%	1%
Senegal	5%	9%	7%	1%	1%	1%	0%	0%	4%	8%	8%	2%	13%	10%	4%	7%	1%	12%	1%	1%	1%	3%
Uganda	17%	35%	2%	0%	1%	1%	1%	1%	2%	2%	2%	1%	3%	12%	4%	5%	1%	4%	2%	0%	2%	1%
Bangladesh	8%	12%	3%	4%	1%	5%	0%	2%	4%	6%	1%	5%	2%	4%	6%	9%	0%	5%	5%	5%	6%	8%
India	4%	9%	3%	3%	3%	3%	4%	3%	5%	4%	6%	3%	10%	4%	7%	4%	2%	5%	3%	3%	4%	4%
Indonesia	3%	3%	1%	1%	1%	1%	1%	1%	7%	8%	23%	3%	24%	6%	3%	2%	1%	4%	1%	1%	1%	1%
Pakistan	6%	7%	16%	2%	3%	1%	2%	2%	3%	5%	4%	2%	6%	5%	17%	4%	2%	5%	3%	2%	3%	1%
Philippines	4%	5%	0%	0%	1%	1%	0%	0%	10%	7%	11%	5%	30%	8%	7%	2%	0%	2%	2%	1%	1%	1%
Sri Lanka	3%	3%	1%	2%	2%	0%	2%	1%	7%	10%	8%	1%	8%	16%	19%	4%	2%	4%	1%	3%	1%	3%
Guatemala	3%	4%	4%	2%	1%	1%	1%	1%	14%	10%	11%	4%	19%	12%	4%	4%	1%	1%	2%	1%	0%	1%
Mexico	5%	3%	1%	0%	3%	2%	1%	0%	9%	14%	23%	5%	18%	6%	2%	1%	0%	2%	1%	1%	0%	2%
Base: Mobile internet users aged 18+ Percentages indicate the proportion of respondents who answered “Yes – this is something that stops me” to the question, “And which one of those factors would you say is the single most important reason stopping you from using the internet more on a mobile phone?” Source: GSMA Consumer Survey, 2025 apart from the Philippines which is based on GSMA Consumer Survey, 2024.																						
Least frequently cited barrier in that country																Most frequently cited barrier in that country			Most frequently cited barrier in that country			

Base: Mobile internet users aged 18+

Percentages indicate the proportion of respondents who answered, "Yes – this is something that stops me" to the question, "And which one of those factors would you say is the single most important reason stopping you from using the internet more on a mobile phone?"

Source: GSMA Consumer Survey, 2025 apart from the Philippines which is based on GSMA Consumer Survey, 2024.







4

Investment Analysis

Targets and Definitions

The investment analysis in this study is designed to answer three questions:

- What level of connectivity and investment is expected in Developing APAC by 2030 under current market and regulatory conditions? This is referred to as the “market frontier.”
- What is the total investment required to achieve universal connectivity by 2030?
- What is the “investment gap”? This is the difference between what the market will deliver and what is required for universal connectivity.

To address these questions, it is necessary to define a set of targets and definitions. This study assumes: 100% broadband coverage for all populations; 95% of the population aged 15+ uses at least 4G mobile internet; at least 70% of the population aged 15+ has basic digital skills; and at least 50% of the population aged 15+ has above basic digital skills.¹² Each of these targets is assumed to be met by 2030, as per the ITU aspirational targets. This provides an anchor on which to benchmark the analysis, although in practice

these outcomes may materialize over a longer horizon (post-2030) for some countries, especially in remote areas. Going forward, the ITU has established a framework that governments can use to monitor these targets and track progress over time.¹³

In terms of the investment scope, the study considers costs associated with last-mile infrastructure (the radio access network, mobile backhaul, use of satellite in remote areas), first-mile and middle-mile infrastructure (for example, core network upgrades, data centers, and international bandwidth), digital skills, and affordability for devices and mobile services. It does not consider costs associated with the following:

- Fixed network expansion (e.g., fiber deployments), as the focus is on mobile infrastructure.
- Broader digital infrastructure such as cloud services and compute requirements.
- Enhanced security investments (e.g., to enhance cybersecurity, address scams etc.).¹⁴

Market Frontier, Coverage, and Usage Gaps by 2030

Figure 11a shows that current 4G population coverage in Developing APAC stands at 98%. This is expected to increase marginally to 98.1% by 2030, as operators extend coverage in areas with sustainable investment returns. This means there will be a 1.9% 4G coverage gap. The analysis models the investment needed to extend 4G coverage to 99%, and for the final 1% it is assumed this will require satellite broadband coverage due to the exponentially increasing cost of deploying 4G networks to the final 1% of the population.

Figure 11b shows the same analysis by subregion, highlighting that a significant 4G coverage gap will remain in Central and West Asia at 7% and in the Pacific developing member countries at 10%. This is due to the high cost of deployment in rural areas, particularly with challenging terrain, as well as the expected low returns, which are significantly driven by low average revenue per user. For example, in Pakistan (which accounts for most of the subregional coverage gap in Central and West Asia), the monthly average

¹² Further details on the targets and their rationale are provided in Appendix 1.

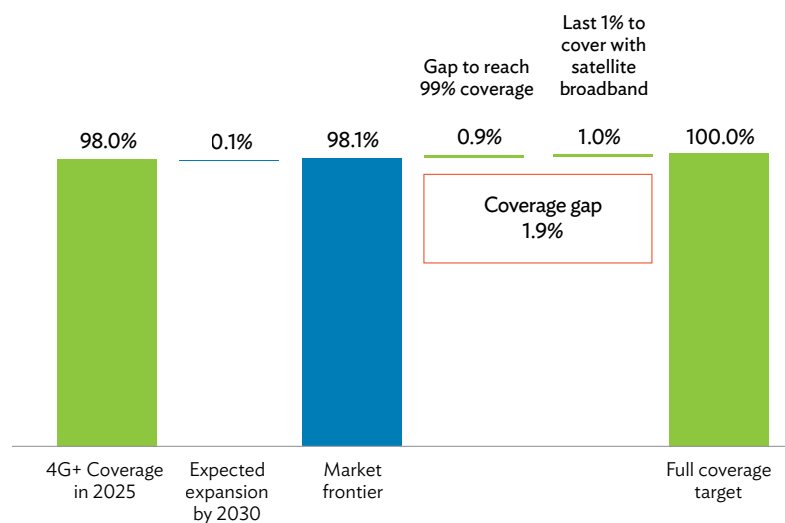
¹³ For example, ITU. 2026. *UMC Measurement Framework: Indicators and Targets*; ITU. 2022. *Achieving Universal and Meaningful Digital Connectivity: Setting a Baseline and Targets for 2030*.

¹⁴ This is an area that will benefit from better data, tracking, and analysis going forward.

revenue per unique subscriber in 2025 stood at less than \$2, compared to a Developing APAC average of more than \$10. It is possible, however, that coverage

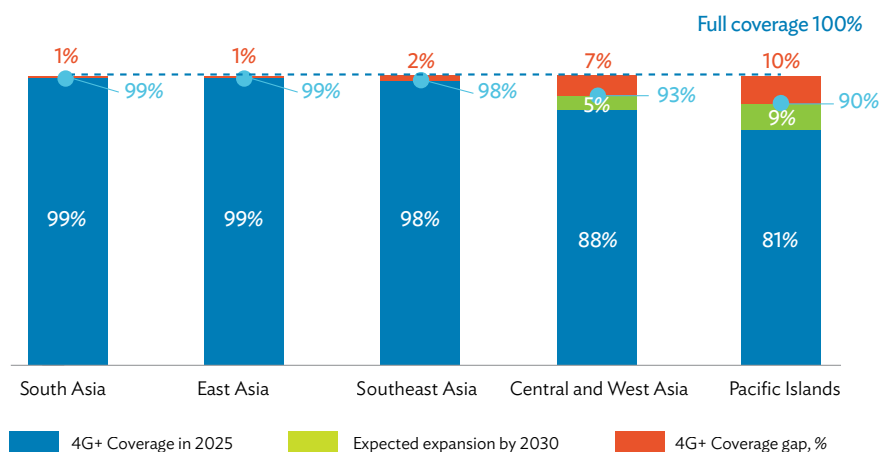
may extend beyond this following the phased rollout obligations that were imposed in the March 2026 spectrum auction.

Figure 11a: Expected 4G Population Coverage by 2030 in Developing Asia and the Pacific



Source: GSMA Intelligence modeling.

Figure 11b: Expected 4G Population Coverage by 2030 in the Asia and Pacific Subregions



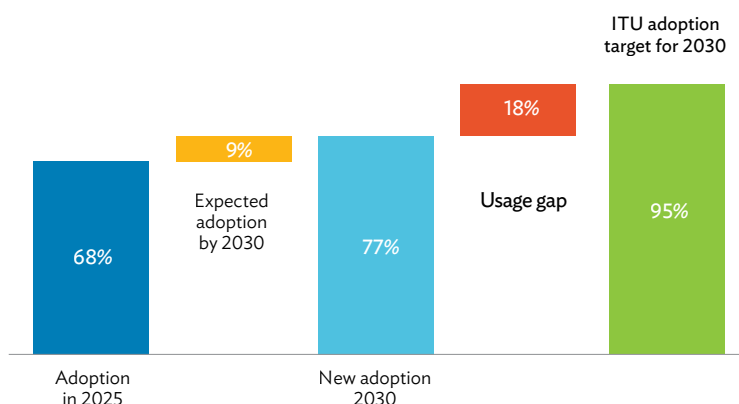
Note: Coverage gaps may appear slightly different to the analysis in Chapter 2 as the base population only considers adults aged 15+ rather than total population. This means that regional coverage gaps can decrease (or increase) if markets with high coverage gaps based on total populations have a relatively larger (or smaller) proportion of population aged below 15.

Source: GSMA Intelligence modeling.

Figure 12a shows that current 4G adoption among adults aged 15+ in Developing APAC stood at 68% by the end of 2025.¹⁵ This is expected to increase to 77% by 2030, meaning a gap of 18 percentage points to reach the adoption target of 95%. Figure 12b shows

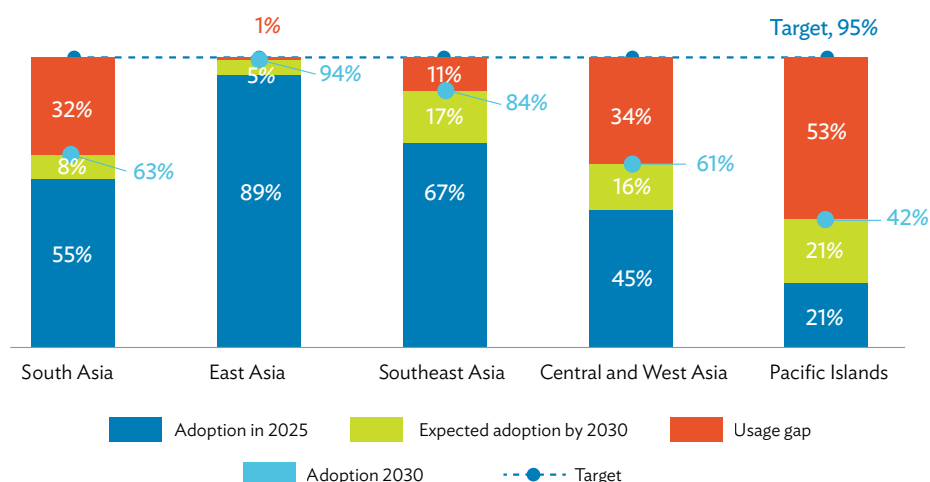
the same analysis by subregion. The biggest usage gaps are expected to be in the Pacific developing member countries, South Asia, and Central and West Asia by 2030.

Figure 12a: Expected 4G Adoption and Usage Gap by 2030 in Developing Asia and the Pacific
(for adults aged 15+)



ITU = International Telecommunication Union.
Source: GSMA Intelligence modeling.

Figure 12b: Expected 4G Adoption and Usage Gap by 2030 in the Asia and Pacific Subregions
(for adults aged 15+)



Source: GSMA Intelligence modeling.

¹⁵ This is different to the adoption estimate shown in Chapter 2 because it considers populations aged 15 and above (and not total population) and also only considers 4G and 5G (not 3G).

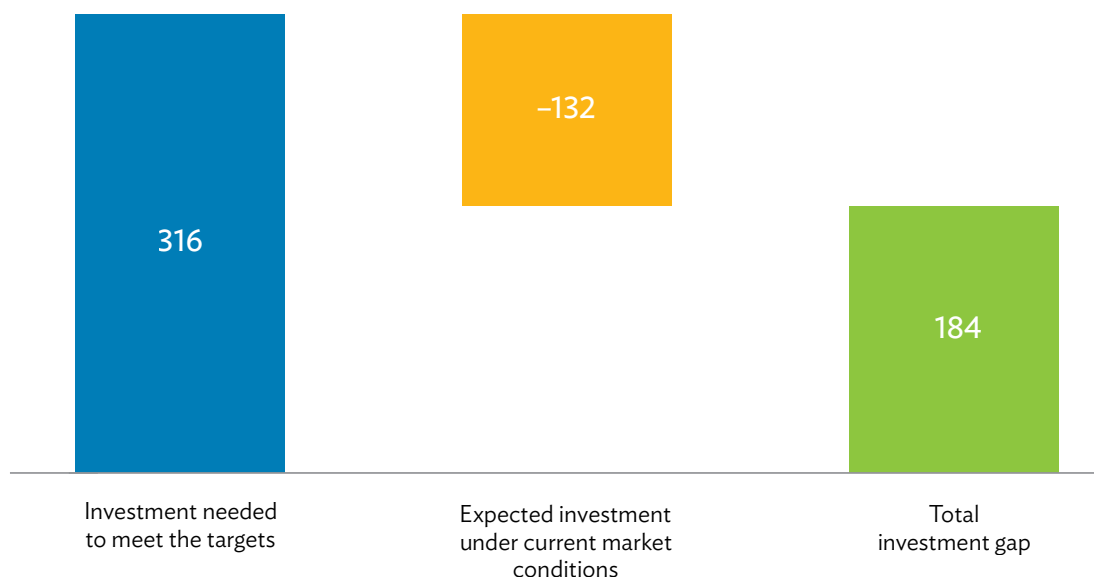
Universal Connectivity Requires Investment of \$316 Billion, with an Investment Gap of Up to \$184 Billion

Connecting 27% of the adult population in Developing APAC to 4G internet will require an investment of \$316 billion. This captures network spend by operators and consumer spend on devices and mobile and satellite services. Under current market and regulatory conditions, \$132 billion will be invested by the private sector and consumers to connect some of the offline population. Achieving universal connectivity by 2030 will therefore require additional investment of around \$184 billion, which is the investment gap (Figure 13). It is important to note that this additional investment only relates to connecting the unconnected. It does not reflect other investment, for example in 5G (and 6G), fixed networks and nonnetwork spend. Further details on the methodology to calculate investment needs and investment gaps are provided in Appendix 1.

The analysis in Figure 14 breaks down the \$184 billion investment gap by barrier. More than half the investment gap (56%) is driven by device affordability and addressing digital skills, which reflects their importance as the primary barriers to mobile internet adoption. The next biggest investment is the deployment of additional network capacity, as bringing 650 million new users onto 4G will require significant capacity upgrades in core, backhaul, and radio access networks to meet additional network traffic demand.

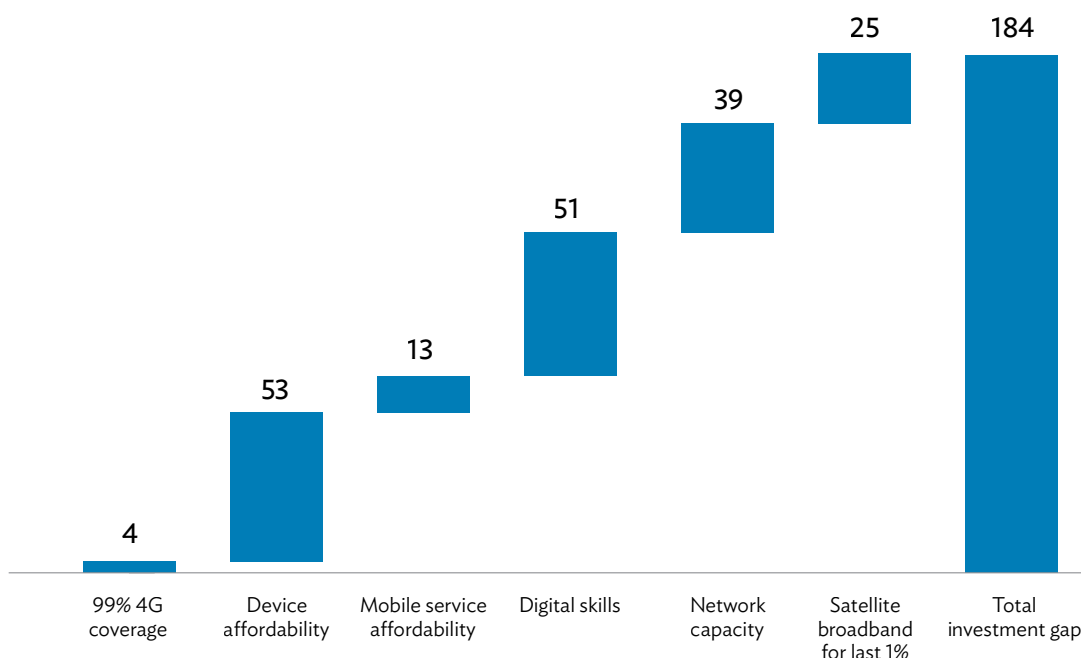
It is estimated that \$25 billion of investment would be required to enable fixed satellite broadband access for the 1% that will not have 4G or 5G coverage. This assumes that users will require a fixed satellite broadband service (this is discussed further in Box 4). The investment gap for extending 4G coverage to 99%

Figure 13: Investment Needs Versus Investment Gaps in Developing Asia and the Pacific
(\$ billion, 2025 prices)



Source: GSMA Intelligence modeling.

Figure 14: Investment Gaps by Barrier in Developing Asia and the Pacific
(\$ billion, 2025 prices)

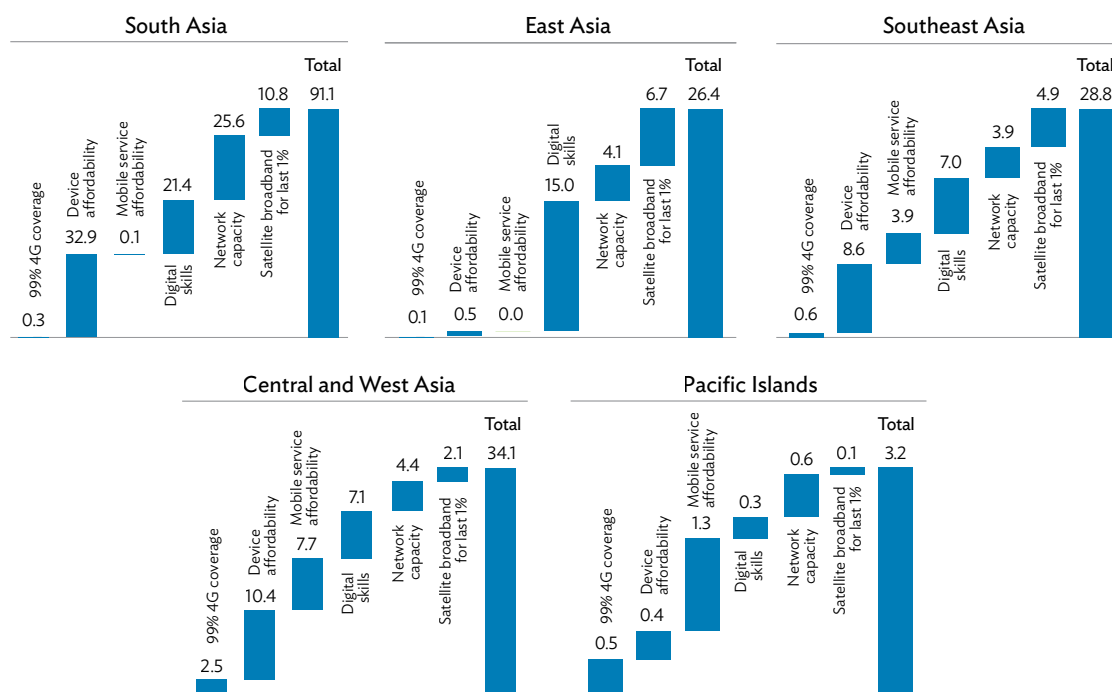


Source: GSMA Intelligence modeling.

of the population is a small proportion of the total gap, reflecting the fact that the region has already achieved 98% 4G coverage. The remaining costs are subsidizing mobile service plans for the population segments that cannot afford them. While mobile is affordable for most of the Developing APAC population, with the average cost of 1 gigabyte (GB) being 1.7% of monthly GNI per capita (below the 2% ITU target), for the poorest 40% of the population, the average cost is 3.3% of monthly GNI per capita. For a 5 GB plan, the average cost is 5.1% of monthly GNI per capita for the poorest 40%.

Figure 15 presents the same investment gap breakdowns for the five subregions. In South Asia, the biggest investment gaps are for device affordability, skills training, and network capacity. In East Asia, skills training and satellite broadband constitute the predominant investment gaps, as the region is expected to reach 94% 4G internet adoption by 2030 under the market frontier. Whereas 4G coverage expansion represents a very small percentage of the investment gaps in South Asia, East Asia, and Southeast Asia, it accounts for 9% of the investment gap in Central and West Asia and 18% in the Pacific developing member countries, driven by the larger coverage gaps.

Figure 15: Investment Gaps by Barrier in the Asia and Pacific Subregions
(\$ billion, 2025 prices)



Source: GSMA Intelligence modeling.

BOX 3

Closing the Investment Gap in the Pacific developing member countries and Central and West Asia

From the investment gap analysis, it is notable that, in the Pacific developing member countries, mobile service affordability accounts for a greater proportion of the gap (at 42%) than in any other subregion. This is due to the higher mobile data costs in small islands. For example, the average cost of a 1 gigabyte (GB) data plan in 2025 in the Pacific developing member countries was \$15, compared to \$3 in the other Developing Asia and the Pacific (APAC) countries.^a This reflects the fact that mobile prices are generally higher in small island states, and so are less affordable for the poorest population segments.

Operators here serve very small, widely scattered populations across many islands, which makes network construction, maintenance, and backhaul more expensive per customer, as operators cannot achieve the same economies of scale as in larger Asian countries. Operators also have to rely on undersea cables, satellite links, and high-cost energy and transport logistics to connect remote communities. On top of that, small island states are highly vulnerable to climate change and disaster triggered by natural hazard, which imposes further cost and risk on network deployments. As a result, Pacific Island telecoms markets face higher unit costs, which pushes retail prices upward. The proportion of the investment gap accounted for by additional network capacity and 4G coverage expansion is also therefore higher in the Pacific developing member countries (at 34%) than in the other subregions. The extent of 4G coverage expansion (i.e., the 4G coverage

continued on next page

Box 3 continued

market frontier) is also highly dependent on the evolution of network input costs and expected demand, and could ultimately range from 85% to 95%. This could potentially mean a role for satellite broadband, though this comes with significant affordability barriers for unconnected consumers (who need to be the focus of additional investment and policy reforms).

While the challenges faced by many Pacific developing member countries are significant, within the Developed APAC region, Maldives offers an example of an island state that has overcome geographic barriers to achieve high levels of mobile internet connectivity. Despite having a dispersed population that inhabits almost 200 small islands, the country has achieved a mobile internet adoption rate of more than 80% and close to 100% 4G coverage (as well as 5G population coverage greater than 80%). This highlights the prioritization of digital transformation by the government, reflected for example in the Maldives 2.0 vision and the Digital Maldives for Adaptation, Decentralization, and Diversification project. In addition to its universal service policies to ensure mobile broadband coverage for all the population, the government has enabled public-private partnerships to realize significant investments in backbone infrastructure, particularly undersea cables and inter-island links. An example of this is the SEA-ME-WE 6 Submarine Cable System: with financial support from the Asian Development Bank (ADB) and International Finance Corporation, a Maldivian operator (Dhiraagu) became a co-owner of a major global submarine cable consortium for the first time.

The challenges around mobile service affordability are also observed in Central and West Asia, albeit not to the same extent as the Pacific developing member countries, as the investment gap for mobile service affordability accounts for 22% of the investment gap (less than the Pacific developing member countries but significantly higher than in East Asia, South Asia, and Southeast Asia). Mobile costs in this region are elevated due to the challenging geography, including mountainous terrain, sparse populations and, in some cases, landlocked status, which means there is a greater dependence on cross-border fiber routes and higher transit prices. This highlights the importance of initiatives such as the ADB's Asia-Pacific Digital Highway, which includes the Central Asia Regional Economic Cooperation Digital Corridor, to improve resilience and expand connectivity to these landlocked and double landlocked countries.

These examples emphasize the importance of undertaking detailed country diagnostics to understand the key barriers to mobile internet adoption and applying tailored policy and investment solutions.

^a GSMA Intelligence analysis of pricing data sourced from Tarifica.

Sources: Government of Maldives. 2026. *Maldives 2.0*; Ministry of Homeland Security, Labour and Technology. 2026. *Digital Maldives for Adaptation, Decentralization and Diversification*; ADB. 2022. *ADB, Dhiraagu to Expand Internet Access in Maldives Through New Undersea Cable System*; International Finance Corporation. 2023. *Connecting the Unconnected – Transforming Digital Infrastructure in the Maldives*; ADB. 2026. *ADB Launches \$70 Billion Push to Connect Asia's Power Grids, Digital Networks*; ADB. n.d. *Central Asia Regional Economic Cooperation (CAREC) Program*.

The Investment Gap is Sensitive to Device, Training, and Satellite Costs

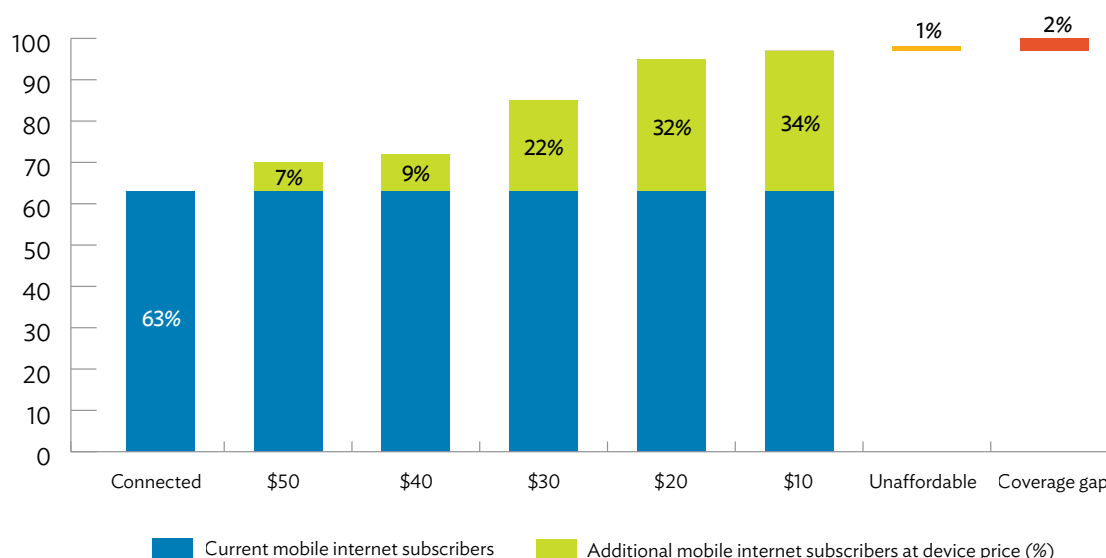
The scale of the investment gap to connect the unconnected is unsurprisingly sensitive to several cost input assumptions. With regard to device affordability, the analysis assumes that the device cost of a 4G smartphone that consumers will meaningfully use is \$100. In practice, there are a number of smartphones and smart feature phones available for less than this, ranging from \$10–\$50 depending on the country.¹⁶ Figure 16 shows that a \$30 device could be affordable to 22% of the population in Developing APAC, while a \$20 device could be affordable to 32%.

This raises the question as to why connectivity is not higher given the availability of such devices. Analysis of device shipments shows that in 2024, sub-\$50 devices shipped in the Asia and Pacific region accounted for 0.2% of total shipments, while devices

in the \$50–\$99 range accounted for 12% of total shipments.¹⁷ GSMA Consumer Survey evidence shows that the reported features that were very important to consumers are long battery life, durability, fast internet and processing speeds, large storage capacity, and good camera quality. While some of these are associated with more expensive devices, certain smartphones and smart feature phones (which can be available for less than \$30) can offer longer battery life and greater durability.

However, there are additional costs beyond the device that also need to be factored in, particularly distribution (which is more expensive in rural and remote areas), onboarding, customer acquisition, and potentially financing costs for those consumers that require handset financing. Recent memory price

Figure 16: The Potential Impact of a Reduction in Device Cost on the Usage Gap in Developing Asia and the Pacific



Note: The analysis is based on the proportion of total population that is a mobile internet subscriber (i.e., 63% refers to mobile internet subscriber penetration).

Source: GSMA Intelligence modeling.

¹⁶ For further analysis on entry-device costs, GSMA. 2025. *State of Mobile Internet Connectivity Report 2025*.

¹⁷ GSMA. 2025. *State of Mobile Internet Connectivity Report 2025* (based on analysis of data provided by Counterpoint Research).

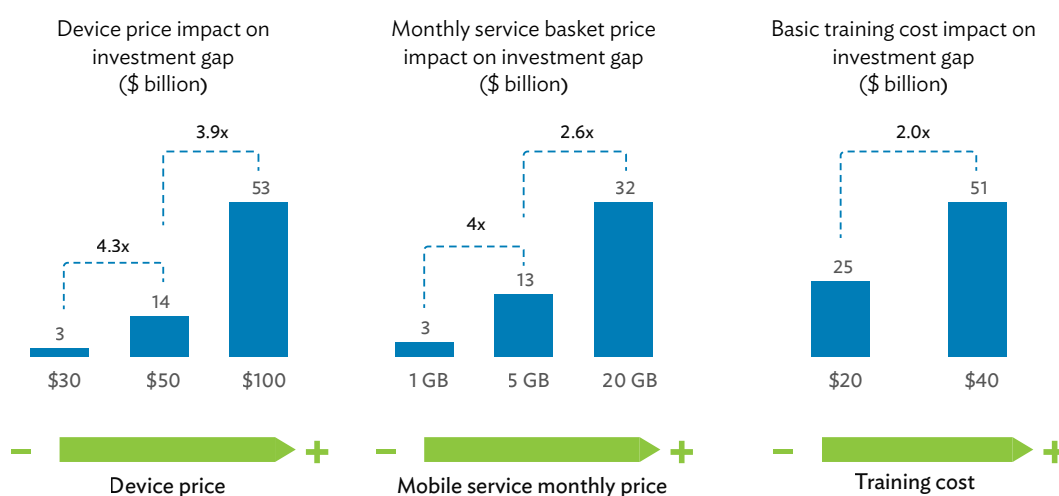
increases are also reshaping bills of material costs and driving higher prices for low-end smartphones.¹⁸ Taking this into account, the investment analysis assumes a total device cost of \$100 per user (this includes the retail price of the handset plus the aforementioned additional costs). However, if the device cost could be reduced to \$50, the investment gap for devices would fall by more than half to \$14 billion. If it could be reduced to \$30, it would reduce considerably to only \$3 billion.

With regard to mobile service affordability, the analysis assumes consumers would at least require a data bundle that allows them to access 5 GB of data per month. If this increased to 20 GB, the investment gap for this element would increase

from \$13 billion to \$32 billion, while if it was 1 GB it would reduce to \$3 billion.

In terms of digital skills, the methodology suggests that the one-off cost to bring individuals to a basic level of skills is around \$40 per person. However, this will vary significantly depending on the approach taken for upskilling consumers (for example, self-guided digital learning, facilitated group training, train-the-trainer models, embedding digital skills with other services, etc.). If the unit cost could be reduced by half to \$20, the investment gap would scale down by the same amount (to \$25 billion). If this could be achieved and combined with a reduction in device cost to \$50, the overall investment gap would decline from \$184 billion to \$119 billion.

Figure 17: Sensitivity of Investment Gap by Barrier in Developing Asia and the Pacific Subregions
(\$ billion, 2025 prices)



GB = gigabyte.

Source: GSMA Intelligence modeling.

¹⁸ In a smartphone, there are two types of memory: dynamic random access memory is short-term storage and NAND (as in “not” and “and”) flash memory is long-term storage for data. Due to the increasing demand for high-performance memory in handsets as well as in AI operations and data centers, coupled with a decline in manufacturing of older memory platforms, there has been a significant increase in memory prices since the end of 2025. This is driving higher retail prices for low-cost smartphones. For example, Counterpoint. 2026. [Memory Price Surge Triggers Shifts in Smartphone BOM Structure](#).

BOX 4

The Role of Satellite Technologies in Supporting Universal Connectivity and How They are Incorporated into the Investment Analysis

There has been a lot of attention given to the potential role of satellite technology to close the connectivity gap in remote areas, particularly with the latest generation of low-Earth orbit (LEO) satellites. At the end of 2025, the largest satellite operator Starlink had almost 10,000 satellites in orbit. It plans to have 12,000 in its constellation. Large new deployments are also expected to be launched by Amazon Leo as well as the China Satellite Network Group.^a

Satellite connectivity can help close the coverage gap in three ways.

Providing fixed satellite broadband connectivity to consumers

The largest global provider of fixed satellite broadband, Starlink, is available in more than 150 economies and territories.^b It has continued to grow its customer base, reaching more than 10 million subscribers as of the second quarter (Q2) of 2026. Around half its customers are in North America, with most of the rest in Asia and the Pacific, Europe, and South America. The service is primarily targeted at households in high-income economies that live in areas with limited fixed broadband alternatives (particularly a lack of fiber broadband access), along with higher-income households in low- and middle-income countries. This is evident from the cost of access, which ranges from \$20 to \$220 for the monthly residential subscription price and from \$190 to \$700 for the hardware. The service is currently providing typical download speeds that range between 20–200 megabits per second (Mbps), depending on the economy.^c Analysis by GSMA Intelligence shows that across low- and middle-income countries, the cost of a Starlink service package is six times higher than the International Telecommunication Union affordability target for entry-level broadband (2% of monthly gross national income per capita), while the upfront cost of a device and necessary Starlink equipment is around five times higher than the affordability threshold considered to represent an affordable device.^d

In this study, the analysis models the investment needed to provide fixed satellite broadband to the final 1% of the population that will not get 4G coverage from terrestrial mobile networks. This is based on the financing needed to close the affordability gap for a fixed satellite broadband service for the unconnected (further details and assumptions are provided in Appendix 1).

Supporting mobile connectivity with satellite backhaul solutions

The cost of mobile backhaul^e in rural sites can be more than double the cost in urban areas.^f Most backhaul in rural areas uses microwave links due to the lack of fiber. However, in many locations, there is no viable microwave backhaul link due, for example, to there being no line of sight to a nearby site or network node. In such cases, the only viable backhaul solution is through satellite. However, the cost of satellite backhaul has been prohibitive to date, at up to 10× higher than microwave, which is why it only accounts for around 2% of all macro and small cell backhaul links.^g

If the new LEO constellations can reduce the cost of satellite backhaul, it could go some way to helping to close the coverage gap. However, other site costs are often prohibitive in remote areas and need to be addressed, particularly base station and energy costs. This is especially important in remote sites with few users, as potential revenues are more limited.

Satellite backhaul is reflected in the investment analysis by incorporating its cost for new 4G sites that are unable to use fiber or microwave backhaul (further details are provided in Appendix 1).

continued on next page

Box 4 continued

Offering direct-to-device connectivity, with satellites acting as “base stations in space”

The technology that has arguably garnered most interest in recent years is direct-to-device (D2D). Connectivity to a mobile device is provided directly from a satellite, without the need for a terrestrial base station or a dish or large receiving equipment. While the technology is not new, the integration of non-terrestrial networks into 3GPP^h has been critical, as standard mobile devices will be able to connect seamlessly with both traditional base stations and satellite systems when out of range of terrestrial connectivity. Recent advances in technologies such as beamforming and phased-array antennas also allow satellites to focus signals more directly to individual devices.

At the end of Q1 2026, 23 operators worldwide had a D2D service—for example, T-Mobile the United States and Telstra in Australia (both partnering with Starlink) and PNCC in Palau and Vodafone in Vanuatu (both partnering with Lynk). Many are currently limited to text messages, but some recent services also incorporate data capabilities. Due to the distances and the size of the satellite beams, D2D connectivity cannot provide a service comparable to terrestrial networks outside of uninhabited locations and areas with extremely low population densities. GSMA Intelligence analysis shows that to deliver a 4G-like service, even if there was a 15,000 satellite constellationⁱ that was able to utilize all Mobile Satellite Spectrum bands, it would not have enough capacity to support a 4G-like service in areas that have a population density of even one person per square kilometer (km²).^j

The relatively low adoption rates that D2D can support are driven by the large distance between the satellite and device, which means that compared to terrestrial networks there is much greater free space path loss^k and much larger satellite beams (or cells).^l It is also important to consider that the majority of existing mobile usage is indoors,^m where satellite signals are blocked or degraded.

For this reason, with respect to the 1% of population that will not have 4G coverage by 2030, the analysis models the investment needed to provide a fixed satellite broadband service rather than a D2D service as it is unlikely to provide a 4G-like service even in areas with low population density during the period considered. A fixed satellite service can provide much higher capacity in remote areas, comparable to 4G and a fiber broadband service, because it utilizes more spectrum in higher frequency bands (for example Ku and Ka bands) and the satellite communicates with a large dish rather than a small phone.ⁿ

Aside from satellite, there are other targeted approaches to connecting remote populations, including community networks, public access connectivity and infrastructure-sharing models. However, these approaches still depend on some form of underlying connectivity infrastructure, whether fixed (fiber), wireless (mobile or fixed wireless access) or satellite-based. While community-led and shared infrastructure models can reduce deployment and operating costs, extending and maintaining connectivity in the most remote areas remains challenging under traditional commercial models. It is therefore necessary to conduct cost-benefit analysis to determine if certain areas would be better served with such alternative solutions.

^a GSMA Intelligence (2026).

^b See Starlink maps. Numbers correct as of Q1 2026.

^c Dano (2026).

^d GSMA (2025).

^e Mobile backhaul refers to the network infrastructure that connects the core network and the radio access network of the mobile network.

^f GSMA Intelligence (2024).

^g GSMA and ABI Research (2021); World Bank (2022).

^h 3GPP is the standards body responsible for developing technical specifications that are developed into global standards for 2G, 3G, 4G, and 5G.

continued on next page

Box 4 continued

- ⁱ At the end of 2025, Starlink had approximately 650 D2D satellites. The company has made a request to the Federal Communications Commission to deploy 15,000 very low Earth orbit satellites for D2D using the Mobile Satellite Services spectrum it acquired from EchoStar Corporation.
- ^j See GSMA. 2026. *The Limits of D2D: Modelling the extent of D2D connectivity*.
- ^k This refers to the signal strength reduction that occurs when any electromagnetic wave (including radio waves, visible light, X-rays, etc.) propagates through free space. Specifically, the power of a signal falls in proportion to the square of the distance.
- ^l A single beam could potentially support an aggregate data rate of more than 100 Mbps. But if a D2D beam diameter is 25 km, that means the total beam area is around 490 km² and all users in the area need to share the total capacity. In dense urban areas, this could mean sharing such capacity (of 100 Mbps) between more than 1 million people, while even in rural areas it could often be shared between more than 100,000 people.
- ^m For further details on indoor and outdoor usage, see GSMA (2024).
- ⁿ Fixed satellite dishes use directive antennas with high gains, which helps to compensate channel losses. This means they capture weaker signals and focus transmissions more effectively than smartphones, which have small omni-directional antennas.

Sources: GSMA. 2024. *Mobile Evolution in 6 GHz*; GSMA. 2026. *The Limits of D2D: Modelling the extent of D2D connectivity*; GSMA Intelligence, 2026. *Satellite and NTN tracker, Q1 2026*; M. Dano. 2026. *2025 Global Satellite Broadband Performance Report*; GSMA. 2025. *State of Mobile Internet Connectivity Report 2025 (Network Coverage and Infrastructure)*; GSMA Intelligence. 2024. *Rural Renewal: Telcos and Sustainable Energy in Africa*; GSMA and ABI Research. 2021. *Wireless Backhaul Evolution: Delivering Next-Generation Connectivity*; World Bank. 2022. *Using Geospatial Analysis to Overhaul Connectivity Policies: How to Expand Mobile Internet Coverage and Adoption in Sub-Saharan Africa*.





5

Economic Benefits of Universal Connectivity

Universal Connectivity in Developing Asia and the Pacific Could Increase Gross Domestic Product by \$230 Billion, Generating a 20% to 100% Economic Return from Closing the Investment Gap

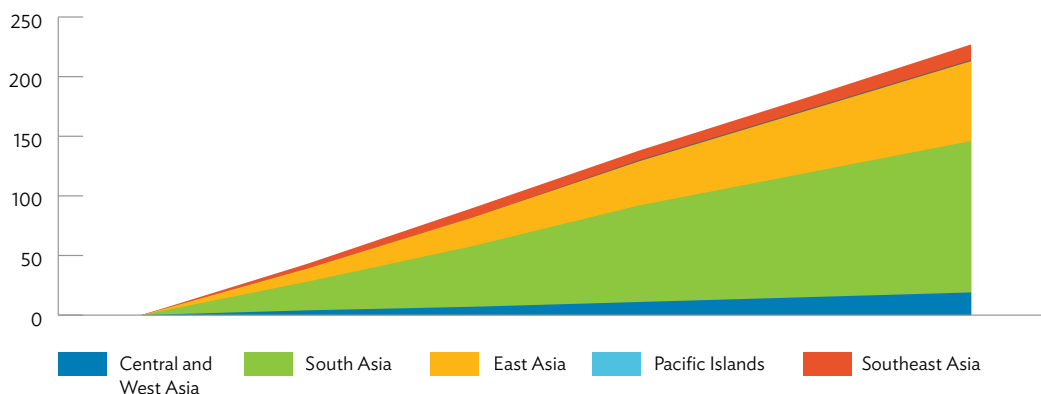
Given that mobile is the primary means of accessing the internet in most Developing APAC markets, accounting for more than 80% of broadband connections in 2025,¹⁹ closing the usage and coverage gaps will also be an enabler of economic growth. Several studies have shown that a 10% increase in mobile broadband penetration can increase gross domestic product (GDP) by 1%–3%.²⁰ This is because it is a general-purpose technology that improves the productivity of firms and workers. It also lowers search and information costs of consumers and producers, enabling new transactions and improving existing ones, stimulating more trade and competition.

Using the existing empirical research, analysis shows that achieving universal connectivity in the region by 2030 could add more than \$230 billion in additional GDP (Figure 18).²¹ This would represent an additional 0.6% of projected GDP growth in 2030. Figure 19 shows the GDP uplift by region, demonstrating the highest returns for the Pacific developing member countries and South Asia, followed by Central

and West Asia, as these are the subregions with the highest expected connectivity gaps in 2030. By contrast, 4G adoption among adults aged 15+ is already at 89% in East Asia, so closing the connectivity gap has a smaller uplift on GDP.

This demonstrates the economic imperative of connecting the unconnected and provides further evidence of why investments and policy reform to accelerate the reduction of the usage and coverage gaps are so critical. Comparing the macroeconomic returns to the investment gap, financing the necessary investment to achieve universal connectivity in Developing APAC at \$119 billion–\$183 billion would result in economic benefits that are 20% to 100% greater. A 20% return would be achieved based on the most conservative cost assumptions in the investment modeling, including a \$100 device cost per user and a basic skills training cost of \$40 per person. If these were reduced to \$50 per device and \$20 of training per person respectively, the economic return would be closer to 100%.

Figure 18: Economic Impact of Closing the Connectivity Gap by 2030
(\$ billion, 2025 prices)

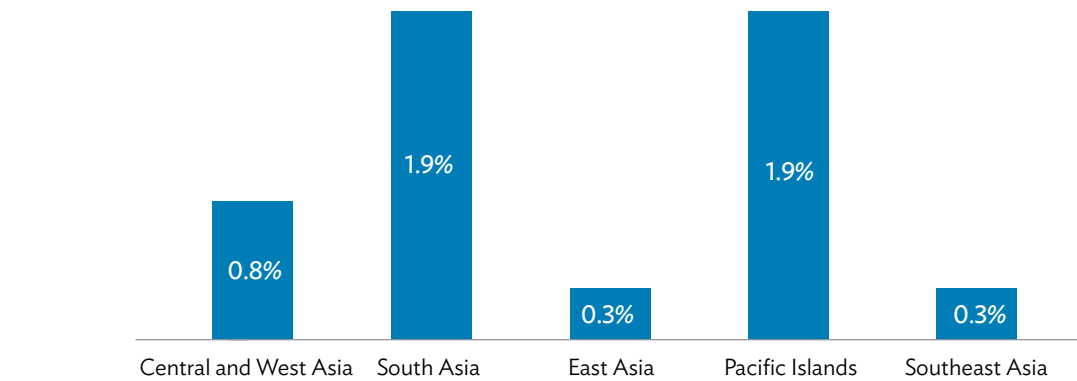


Source: GSMA Intelligence.

¹⁹ ITU. 2025. Statistics.

²⁰ See <https://www.itu.int/en/ITU-D/Regulatory-Market/Pages/Economic-Contribution.aspx> and GSMA. 2020. Mobile Technology and Economic Growth.

²¹ For details on how the economic opportunity of closing the mobile internet usage gap is calculated, see Appendix 2 in the GSMA. 2024. *State of Mobile Internet Connectivity Report*.

Figure 19: Gross Domestic Product Uplift by 2030 if Usage Gap is Closed, by Subregion

Source: GSMA Intelligence.

Connecting the Unconnected Will Unlock Other Socioeconomic Benefits

The GDP-based economic analysis captures only part of the value of universal connectivity. Consumer survey data from Developing APAC markets, presented in Table 4, shows that a significant proportion of mobile internet users engage with use cases beyond communication and entertainment, including education, online commerce and banking, job search, health services, and government services.

These use cases can ultimately drive a range of benefits, including:

- **Poverty reduction:** Multiple empirical studies demonstrate that mobile broadband connectivity reduces poverty. Access to mobile financial services, market price information, e-commerce, digital job platforms, and remote work opportunities have been shown to materially increase household incomes and consumption, particularly in rural areas. In Indonesia, it was found that a 1% rise in mobile broadband coverage corresponds to a 0.02% decrease in poverty rates.²² Another study in the Philippines found that mobile internet connectivity increased household wealth,²³ while a study in the PRC showed mobile

internet use has a significant negative impact on multidimensional poverty.²⁴ Other studies have shown similar effects, for example in Tanzania²⁵ and in Nigeria, where the deployment of mobile broadband lifted around 2.5 million people out of extreme poverty, with rural households gaining more in relative terms than urban households.²⁶

- **Employment and job creation:** These studies also found that mobile broadband increases employment. In the Philippines, mobile internet promoted female labor force participation. In Tanzania, working-age individuals in areas covered by mobile broadband saw a 4–6 percentage point increase in labor force participation, a rise in wage/salaried employment (by 2–4 percentage points) and an increase in non-farm self-employment (by 3–5 percentage points), increasing local economic diversification and resilience. In Nigeria, areas covered by mobile broadband experienced a 3 percentage point increase in labor force participation, with a shift from farm self-employment to non-farm opportunities.

²² Ariansyah et al. 2024. *The Role of Mobile Broadband in Poverty Alleviation: A Comparison of the Effects of 3G and 4G Network Expansion in Underdeveloped Regions of Indonesia*.

²³ Iddawela et al. 2025. *Mobile Internet Connectivity and Household Wealth in the Philippines*.

²⁴ Yang et al. 2021. *Mobile Internet Use and Multidimensional Poverty: Evidence from a Household Survey in Rural China*.

²⁵ Bahia et al. 2023. *Mobile Broadband Internet, Poverty and Labor Outcomes in Tanzania*.

²⁶ Bahia et al. 2024. *The Welfare Effects of Mobile Broadband Internet: Evidence from Nigeria*; GSMA and World Bank. 2020. *The Poverty Reduction Effects of Mobile Broadband in Africa: Evidence from Nigeria*.

Table 4: Activities Undertaken by Mobile Internet Users at Least Once per Month

MOBILE INTERNET USE CASES AMONG MOBILE INTERNET USERS																			
Country	Call online	Video calls	IM	Social media	Online video	Online entertainment	Read news	Search for online information	Education/ learning support	Search for online job/ business information	Order goods/ services	Income generation	Online banking /Mobile money	Health services	Govt services	Agriculture information	Employment or online work	Social media use for work or business	Online banking or mobile pay bills on mobile phone
Egypt	76%	70%	80%	83%	83%	76%	43%	43%	30%	19%	32%	19%	22%	28%	24%	4%	20%	41%	17%
Ethiopia	58%	52%	65%	84%	61%	73%	54%	25%	23%	18%	7%	9%	33%	20%	30%	11%	20%	24%	23%
Ghana	86%	85%	89%	91%	82%	80%	58%	52%	55%	40%	25%	37%	33%	34%	31%	12%	25%	88%	27%
Kenya	80%	74%	92%	93%	90%	88%	69%	58%	57%	44%	21%	33%	53%	43%	40%	30%	41%	63%	46%
Nigeria	87%	81%	91%	89%	76%	68%	62%	39%	43%	36%	21%	43%	66%	28%	27%	16%	25%	76%	60%
Senegal	79%	68%	92%	88%	77%	77%	59%	37%	40%	30%	29%	36%	69%	34%	37%	14%	20%	91%	63%
Uganda	73%	63%	79%	84%	79%	80%	59%	37%	34%	34%	9%	20%	27%	28%	26%	22%	15%	45%	22%
Bangladesh	79%	85%	70%	74%	79%	73%	37%	44%	29%	17%	31%	25%	32%	29%	27%	3%	25%	50%	25%
India	81%	81%	83%	84%	88%	81%	63%	59%	58%	38%	54%	49%	58%	54%	53%	21%	53%	56%	46%
Indonesia	95%	94%	95%	88%	92%	82%	60%	48%	39%	31%	53%	19%	40%	32%	33%	8%	25%	57%	33%
Pakistan	76%	81%	80%	74%	79%	65%	29%	21%	26%	13%	21%	19%	31%	18%	23%	9%	22%	34%	18%
Philippines	91%	95%	96%	96%	96%	93%	70%	56%	57%	29%	58%	20%	27%	36%	38%	9%		34%	17%
Sri Lanka	68%	88%	92%	93%	95%	93%	75%	58%	73%	29%	50%	23%	44%	40%	50%	13%	40%	46%	31%
Guatemala	97%	91%	95%	95%	88%	85%	72%	63%	74%	45%	30%	37%	44%	50%	43%	13%	41%	72%	37%
Mexico	85%	83%	94%	91%	89%	83%	76%	75%	74%	45%	61%	43% ^x	61%	56%	57%	6%	41%	66%	52%

IM = instant messaging.

Note: Percentages indicate the proportion of respondents who answered that they have performed each activity on a mobile in the previous month. Respondents may have engaged in some use cases on a phone other than their own.

Source: GSMA Consumer Survey, 2025, apart from the Philippines which is based on GSMA Consumer Survey, 2024.

Most common use cases

Least common use cases

- **Education:** Mobile internet access can improve education quality and learning outcomes by facilitating access to remote learning content and supporting literacy and skills development. From a policy and global development perspective, the UN Sustainable Development Goal 4 (Quality Education) framework recognizes the importance of technology, including mobile, in promoting equitable quality education and lifelong learning opportunities.
- **Health:** Mobile connectivity has been linked to improved health outcomes across a range of indicators, including reductions in maternal and child mortality (through access to health information and telemedicine), improved disease surveillance and better access to health services. The coronavirus disease (COVID-19) pandemic also highlighted the critical importance of digital connectivity for health-system resilience.²⁷ Mobile ownership combined with internet connectivity is also associated with an improvement in people's lives and wellbeing, with particularly strong impacts demonstrated in Asia.²⁸
- **Humanitarian assistance:** The ability to use mobile phones to communicate and access information and services in emergency situations—as well as facilitate the provision of aid—is now widely recognized as an essential form of humanitarian assistance. Early warning systems also enable rapid, scalable dissemination of risk information, improving preparedness and response outcomes from hazards such as earthquakes, cyclones, floods and other disasters resulting from the impacts of changes in the climate. This is particularly relevant in South Asia and the Pacific developing member countries—one of the world's most disaster-prone regions. A number of markets are working to introduce a cell broadcast-based

early warning solution, including the Cook Islands, Kiribati, Samoa, and Solomon Islands. However, it is necessary for all populations to have access to a mobile device for them to benefit from this.²⁹

- **Climate and the environment:** GSMA research estimates that mobile technologies enable carbon emissions reductions approximately 10 times greater than the carbon footprint of mobile networks themselves.³⁰ Smart agriculture applications, precision irrigation, supply chain optimization and energy management all represent connectivity-enabled pathways to reduced emissions in Developing APAC's economies.

In addition, internet access is now a prerequisite for individuals and communities to benefit from emerging technologies such as AI and quantum computing. Without reliable connectivity, Developing APAC risks being excluded from the tools, services, and opportunities that these technologies enable. Being online allows access to AI-driven educational platforms, telemedicine, e-government services, and financial technologies that improve skills, health outcomes, and economic participation. It also enables individuals to engage in digital marketplaces, remote work, and entrepreneurship, ensuring they can participate in the new digital economy.

For the wider economy, enterprise adoption of these technologies drives efficiency, innovation, and new revenue streams. Analysis by GSMA Intelligence shows that by 2030, digital transformation by enterprises could boost the global economy by almost \$11 trillion, representing around 8% of GDP.³¹ By enabling everyone to participate, Developing APAC countries can accelerate development, reduce inequality, and secure a share of the growth generated by digital transformation.

²⁷ Fabra et al. 2025. *The Contribution of ICTs and Telemedicine to COVID-19 Vaccination: Evidence from the United States*; Rotondi et al. 2020. *Leveraging Mobile Phones to Attain Sustainable Development*; GSMA. 2018. *Creating Mobile Health Solutions for Behaviour Change*.

²⁸ GSMA and Gallup. 2018. *The Impact of Mobile on People's Happiness and Wellbeing*; Mobile Connect.

²⁹ UNDRR. 2025. *Global Status of Multi-Hazard Early Warning Systems*; GSMA. 2026. *Innovating Early Warning Systems in Pacific Small Island Developing States for Climate Resilience*.

³⁰ GSMA. 2019. *The Enablement Effect: The Impact of Mobile Communications Technologies on Carbon Emission Reductions*.

³¹ GSMA Intelligence. 2025. *Economic Growth and the Digital Transformation of Enterprises: Impacts and Projection*.





6

Policy Recommendations

The analysis in this study highlights the scale of investment needed to close the connectivity gap in the Developing APAC region. To address this, policy and regulatory reforms are required to unlock additional investment, while additional financing from outside investors, including ADB, will also be needed. In order to determine the most effective intervention, it is recommended to conduct a detailed country diagnostic to understand the key barriers to mobile internet adoption. This can leverage available data and benchmarks such as the GSMA MCI (as highlighted in Chapter 3). Once the priority areas are identified, the results of this research and other studies can be used, combined with relevant country-level data and analysis, to determine the most impactful policy reforms and support options. These diagnostics can also inform the sequencing of policy reforms,

such that those with most impact or those that need to be in place to unlock other reforms are prioritized.

Governments and regulators in the region can leverage a number of policy levers to reduce the \$183 billion investment gap, by reducing the cost of deployment and/or by increasing the returns on investment for the private sector and making the investments financially sustainable. Table 5 sets out some of the policy reforms governments could consider. Taken together, these will not only accelerate the path to universal connectivity but ultimately serve as a critical input to wider economic and digital transformation, as countries will be better placed to enable digital public services, firm productivity, and AI-enabled innovation.

Table 5: Policy Reforms that Could Reduce the Investment Gap

Policy area	How it can reduce the investment gap and increase connectivity
Support device financing and subsidy schemes	The cost of devices is primarily driven by bills of materials and currently there is little scope to significantly reduce these.^a Recent memory price increases are also reshaping bills of materials costs and driving higher prices for low-end smartphones.^b There is also a growing secondary and circular market,^c but these devices are also well above the \$20–\$30 price points that would make handsets more affordable. Additionally, there are other non-price factors to address for circular models, including limitations in scale.^d Addressing device affordability will therefore require governments and investors to support device financing schemes. This could be done by lowering the financing risks, for example via partial credit guarantees, structured finance, NBFIs^e asset financing, supply chain financing and debt or equity funding for the secondary/refurbished market.^f Another option is to fund or support credit-scoring innovations to expand access for unbanked users. Lastly, where device financing is not feasible, governments, investors, and the private sector (including operators, NBFIs, handset vendors, and content providers) can support device subsidy programs. However, it is important these programs are accompanied by investments and policies to support skills and relevant content (discussed below), as some evidence suggests that simply “handing out” a fully subsidized device typically results in the consumer selling the device (or trading it down) for cash.^g
Remove or reduce sector-specific taxation	Sector-specific taxes on mobile services and handsets make them less affordable, especially to the poorest population segments. 13 economies in the Developing APAC region charge a sector-specific tax on mobile services (in addition to general sales taxes such as VAT)—for example, in Bangladesh, Malaysia, and Sri Lanka.^h Eighteen countries also charge import duties on handsets, which exacerbates device-affordability barriers. Reducing or removing these would improve affordability and stimulate demand, thereby bringing more people online, increasing demand and revenues and therefore reducing the investment gap. Similarly, sector-specific taxes on mobile operators (but which do not apply to firms in other sectors) can distort and reduce investment in the sector. Reducing or removing these would increase investment in network coverage and capacity, which can drive greater internet adoption and country digitalization.

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Table 5 *continued*

Policy area	How it can reduce the investment gap and increase connectivity
Develop and implement digital skills strategies	Governments should develop digital skills strategies focused on use cases that help targeted user segments, including underserved segments such as women, rural populations, and people with disabilities. To scale impact, governments should partner with private sector actors—such as telecoms operators, tech companies, and training providers—to co-design and deliver relevant training programs aligned with consumer and business needs. At the same time, digital skills development should be embedded across national education systems, from primary to tertiary levels, ensuring that foundational and advanced digital competencies are systematically built over time. The private sector and other investors can also support innovative delivery models—such as mobile-based learning and community-led training—designed to reach low-connectivity and underserved areas at scale, as well as hard-to-reach communities.
Reform universal service funds (USFs)	USFs are tools that governments can use to incentivize network rollout in underserved locations and stimulate demand by consumers. In theory, the USF contributions made by operators should be reinvested into the sector to expand networks using public–private partnerships and bring coverage to areas that are below the threshold of commercial viability for the private sector. Alternatively (or in addition), USFs can be used to stimulate demand, for example by subsidizing device costs or mobile service plans, or supporting handset financing schemes and/or digital skills training. Going forward, given the usage gap is the biggest connectivity barrier, demand stimulation is likely to become a more effective use of USFs. However, research has shown that USFs have typically not been effective in delivering their core objectives and have even been counterproductive in some cases.ⁱ Funds are often not disbursed in full (or not at all in some countries), projects are not monitored and evaluated (so it is not clear what the impacts have been and whether they are sustainable) and the contributions are typically only raised from mobile operators, even though other firms in the digital ecosystem (as well as the government) benefit from greater connectivity. This means that USFs often function as a distorting sector-specific tax, with little re-investment that benefits the sector or consumers. It is therefore important to reform USFs where they are not functioning effectively. This includes adopting mechanisms to incentivize disbursement, setting clear and measurable targets, using data-led approaches to select projects, ensuring regular performance monitoring and reporting, considering different funding mechanisms, and building capacity and skills within the USF.^j USFs should also be considered to address barriers related to skills, affordability and content. A lot of USFs continue to lean toward coverage. This can play a critical role to de-risk or part-subsidize coverage investments in locations where an operator cannot deploy infrastructure due to uncertainty in costs and revenues, or in cases where investments would be sustainable if the upfront capital expenditures were partially or fully subsidized. However, as highlighted in this study, the main barriers to digital inclusion are primarily affordability, digital skills, and safety and security, as well as relevant content. Therefore, more USF funds can be used to support adoption, for example through subsidized access for low-income users; funding connectivity for schools; and broader ICT programs combining devices, connectivity, and services. Several USFs have started supporting adoption as well as coverage, including in India, Malaysia, and—outside of Developing APAC—in the United States.

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Table 5 continued

Policy area	How it can reduce the investment gap and increase connectivity
Increase digital trust with safety and security policies	Cybersecurity is now a foundational pillar of mobile network operations, requiring significant and growing resources. It is estimated that the cybersecurity costs to mobile operators alone will reach around \$40 billion by 2030, with the burden of investments falling heavily on low- and middle-income countries. At the same time, the expansion of digital technologies has been accompanied by an increase in consumer scams, which has an impact on victims and the wider economy. It is estimated scammers siphoned around \$1 trillion worldwide in a single year.^k Addressing scams, fraud, and other safety and security concerns is critical to ensure consumer trust and confidence in using mobile internet, and that the socioeconomic benefits of internet access can be maximized. As noted in Chapter 3, this is an increasingly important barrier to further mobile internet use for consumers. Legislators and regulators should consider the following core principles when shaping cybersecurity policy: ➤ Align cybersecurity with international standards to reduce regulatory fragmentation and inconsistency. ➤ Ensure new policies and frameworks are consistent with existing policy to avoid duplication or conflicting requirements and reduce the cost of compliance. ➤ Adopt risk-based and outcome-based approaches in the design of regulation. ➤ Promote collaboration across the mobile ecosystem, including operators, digital platforms and payment service providers. ➤ Ensure a proactive security-by-design approach is adopted. ➤ Strengthen the institutional capacity of governments and authorities. To tackle fraud and scams, governments should foster collaboration across the ecosystem and incentivize innovation. For example, AI can be used to detect fraudulent activity more efficiently, quickly, and at scale, to prevent unauthorized access and expose deceptive schemes targeting consumers. It is also important to promote consumer education and effective reporting.^l
Expand content, services and use cases	Half of the 7,000 languages spoken in the world do not have a digital footprint, while less than 0.5% of the world's living languages are considered as having attained "full" digital capabilities. This represents a digital language divide that particularly affects countries that are linguistically diverse or where large segments of the population do not speak a language with digital capabilities, for example in the Pacific developing member countries and in South Asia. This highlights the importance of funding and supporting local-language digital content initiatives to incentivize uptake and use (for example, apps focused on public health, education, and disaster preparedness). Furthermore, as digital services become increasingly AI-enabled, there is an opportunity to significantly enhance the relevant use cases the internet can bring to the offline population (for example, voice-assisted AI), but this is hindered by the large number of languages that are low resource.^m A growing number of efforts are addressing this linguistic imbalance. Startups, innovators, researchers, and communities are building and applying locally relevant AI models, curating and crowdsourcing linguistically diverse datasets, and creating enabling environments for greater AI language inclusion. However, these efforts are operationally demanding, are resource intensive and introduce several ethical considerations, particularly when they involve community crowdsourcing. They also lack the capacity to reach last-mile users at scale, creating datasets and models without distribution. These challenges are compounded by limitations in compute infrastructure and sustainable funding in LMICs. Addressing these challenges will require involvement across the ecosystem. Mobile operators and technology companies can play a role by deploying language technologies at scale, convening partners and, in some cases, providing shared digital and AI infrastructure. Governments and policymakers can help create enabling environments for inclusive AI by investing in digital public infrastructure, affordable compute capacity and open, multilingual datasets, particularly for low-resource languages. They can also establish clear governance frameworks for data protection, consent and ethical community participation, while supporting research, innovation and public-private partnerships that strengthen local AI ecosystems.

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Table 5 *continued*

Policy area	How it can reduce the investment gap and increase connectivity
	In addition to accelerating internet connectivity, it is important to develop the broader digital ecosystem to maximize the social and economic benefits of digital transformation and future technologies, including AI. This includes enabling services such as e-government, digital identity and digital payments, as well as digital public infrastructure and data governance. To achieve this requires whole-of-government approaches, including national digital strategies, cross-ministerial coordination, and institutional frameworks for digital development. It is also important for governments to support the underlying infrastructure for data and compute, align skills strategies with emerging technologies, and enable adoption in priority sectors (for example, the public sector, small and medium-sized enterprises and/or key national industries such as agriculture or manufacturing).
Assign available spectrum bands at sustainable prices	Research has shown that across the majority of countries worldwide, the cost of spectrum has increased significantly over the past 10 years, in large part because spectrum costs have not adjusted to the declining returns on spectrum that operators make. High spectrum cost reduces coverage and network quality, while not assigning all available International Mobile Telecommunications (IMT) bands also hinders the deployment of new technologies and quality of service.ⁿ Several countries in Developing APAC have spectrum cost-to-revenue ratios well above global benchmarks, including Bangladesh, India, Indonesia, Pakistan, and Thailand.^o Meanwhile, a number of countries have not assigned all IMT bands that could be used for 4G and 5G, with countries such as Bangladesh, Indonesia, Myanmar, and Thailand assigning less spectrum than the average amounts seen in the region.^p Assigning this spectrum at sustainable prices would help unlock additional investment and provide better-quality services to consumers. The assignment of mid-bands (frequencies above 1 gigahertz [GHz]) is critical to meet growing traffic demand, especially in urban areas, and would enable operators to better meet demand if 4G adoption is accelerated to achieve universal connectivity. In terms of rural coverage, the assignment of low bands (frequencies below 1 GHz) is particularly important and the pricing should reflect forward-looking valuations given the significant decline in low-band spectrum values over the past decade.
Enable dynamic competition and operator scale	Since 4G became the predominant technology in mobile and the sector shifted from voice/SMS to a data-intensive era, the nature of competition has changed. Operators face rising network costs, declining revenues per user and rapidly growing consumer demand for high-speed mobile data, and this transition requires sustained investment in 4G and 5G networks. In this context, operator scale has become central to ensuring that networks can deliver the capacity, coverage, and quality consumers now require. Research has shown that the relationship between market concentration and investment and quality follows an “inverted-U” pattern, with operators in many markets not having the necessary scale to effectively invest, innovate and therefore compete.^q Policymakers should therefore take a balanced consideration of both the negative and positive effects of mergers and market entry on dynamic competition incentives and investments.^r For example, regulatory remedies that artificially create entry do not necessarily strengthen the dynamic competition conditions that the evidence shows are needed to enhance welfare. This applies to competition policy but also spectrum policy, which regulators have previously used to support a new entrant that has ultimately not been financially viable or sustainable in the long term. In many Developing APAC markets, regulators have recognized this trend and have enabled greater scale through consolidation in the past decade—for example, in India, Indonesia, Malaysia, and Thailand.

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Table 5 *continued*

Policy area	How it can reduce the investment gap and increase connectivity
	Another consideration is competition between different types of connectivity solutions—for example, fixed, mobile, and satellite networks. In this context, it is important that all providers of internet connectivity are regulated under clear, transparent, and consistent frameworks to enable competition and investment. Regulations or policies that are favorable to one type of service will ultimately distort investment and impact consumer welfare. Another policy area that impacts competition is around licensing, particularly the premise of unified licensing frameworks that are service neutral (rather than service-specific licenses that require separate licenses for mobile broadband, fixed wireless access, fixed, satellite etc.). This simplification enables communication providers to offer a range of connectivity services on a single license, and therefore encourages competition and innovation by enabling multi-access solutions. It can also enable smaller providers to cover niche areas, including remote regions, with the most efficient technology.
Promote and enable infrastructure sharing and lower-cost energy access	Shared network infrastructure can improve coverage and connectivity by enabling cost savings, balance-sheet optimization and competition. It spreads the cost of network expansion across multiple market participants and can generate significant capex savings for connectivity service and digital infrastructure providers (including operators, internet service providers and tower companies).⁵ However, it is important that the terms of sharing are not mandated by regulation or policymakers without industry consultation and buy-in, as the most successful examples of infrastructure sharing have been market-led or voluntary. For example, commercial-led infrastructure sharing in Europe and Latin America has resulted in lower prices and improved network coverage and quality, driven by cost reductions and higher returns on investment.⁴ Policies that expand access to the electricity grid and renewable energy solutions are also important to reduce the cost of network deployment, especially in rural and remote areas. Energy costs in these locations are generally higher because operators have to use diesel generators where grid access is patchy or non-existent. These represent a considerable proportion of operators' capital and operational expenditures. Therefore, policies that can either expand access to the main electricity grid or enable mini-grid solutions, as well as support renewable solutions (for example, solar-powered energy), can play an important role to reduce network costs and increase the reliability and resilience of mobile networks.
Ensure proportionate quality of service regulations	Many regulators have imposed quality of service (QOS) regulations to improve consumer outcomes. However, these have often had negative and unintended consequences by increasing costs and requiring operators to dedicate investment on QOS parameters that consumers do not require (and which are not financially sustainable) and which might have otherwise been spent on expanding coverage or upgrading infrastructure (e.g., to 4G or 5G).⁴ In practice, the main drivers of QOS in mobile networks have been investments in new technologies, assigning sufficient spectrum bands, the adoption of smartphones, reliable power supply, deployment of fiber infrastructure (particularly for backhaul) and local regulations. While reasonable baseline QOS parameters can be considered to ensure consistency in service, it is important that QOS requirements do not impose costs that displace more efficient investments.
Enhance implementation capacity	Many countries may have enabling policies and regulations “on paper,” but they fall short on implementation. This can be due to institutional capacity, regulatory capability, and institutional coordination. Addressing these capacity gaps, where they exist, is important to ensure the effectiveness of any of the highlighted policy reforms.

^a GSMA. 2024. Analysis to improve handset affordability.

^b GSMA. 2026. *State of Mobile Internet Connectivity Report 2026*.

^c GSMA. 2025. Rethinking Mobile Phones: The business case for circularity.

^d See Counterpoint. [Why Are Refurbished Smartphone Prices Rising](#) and [Counterpoint. Apple Reaches New High in Global Refurbished Market in 2025, But Supply Remains a Challenge](#).

^e Non-bank financial institution.

^f See World Bank. 2023. *Affordable Devices for All*.

^g See, for example, Roessler et al. 2021. The Economic Impact of Mobile Phone Ownership: Results from a Randomized Controlled Trial in Tanzania.

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Table 5 *continued*

- ^h See, for example, GSMA. 2023. Review of Mobile Taxes and Fees in Bangladesh.
- ⁱ See, for example, The Impact of Universal Service Funds on Fixed-Broadband Deployment and Internet Adoption in Asia and the Pacific, Asia-Pacific Information Superhighway (AP-IS) Working Paper Series, United Nations Economic and Social Commission for Asia and the Pacific, 2017.
- ^j See, for example, GSMA. 2023. Universal Service Funds in Africa: Policy Reforms to Enhance Effectiveness.
- ^k See GSMA and Frontier Economics. 2025. The Impact of Cybersecurity Regulation on Mobile Operators and GSMA Intelligence. 2025. Towards a Digital Nation: Addressing the Scam Economy in Asia and the Pacific.
- ^l Further details can be found at GSMA. 2026. United Against Scams.
- ^m A low-resource language is one that has limited or no representation in AI research, datasets and digital products, in contrast with high-resource languages, which are well represented in AI systems.
- ⁿ See GSMA. 2025. Global Spectrum Pricing.
- ^o See [Spectrum Pricing Helps Boost Mobile Services](#).
- ^p Spectrum assignment benchmarks are included in the MCI.
- ^q See, for example, K. Bahia, and P. Castells. 2023. “The Dynamic Effects of Competition on Investment: The Case of the European Mobile Communications Industry.” *Journal of Information Policy* 13: 249–309.
- ^r For further details see BRG. 2026. [A Dynamic Framework for the Assessment of Horizontal Mergers](#).
- ^s See, for example, IFC. 2020. *Accelerating Digital Connectivity Through Infrastructure Sharing*, and GV Hounghon et al. 2023. The impact of shared telecom infrastructure on digital connectivity and inclusion. *TSE Working Paper*.
- ^t See Koutroumpis et al. 2023. “To share or not to share? The impact of mobile network sharing for consumers and operators” and Katz et al. 2023. Impact of Infrastructure Sharing on Digital Technology Adoption in Latin America and the Caribbean.
- ^u For further discussion, see GSMA. 2025. Towards better mobile quality of service in Asia and the Pacific: Assessing the role of regulation.
- Source: GSMA. 2025. [Towards Better Mobile Quality of Service in Asia Pacific](#).





Appendixes

Appendix 1

Investment Methodology

This appendix sets out the methodology and assumptions behind the study's investment analysis.

Targets and definitions

The investment gap requires a set of targets and definitions. These are as follows:

- *Technology*: the analysis focuses on 4G as the minimum level of connectivity to be provided and adopted, as per the International Telecommunication Unit (ITU) definition of meaningful connectivity. This is defined as the level of connectivity that allows users to have a safe, satisfying, enriching, and productive online experience. According to the ITU targets, this means reaching a download speed target of at least 20 megabits per second, which is best achieved with 4G.¹ Using 4G as the minimum standard is also aligned with the ongoing shutdowns of 3G networks in many Developing Asia and the Pacific countries.
- *Target population*: the analysis considers populations aged 15 and above, in line with the ITU connectivity targets.²
- *Connectivity targets*:
 - 100% broadband coverage for all populations, in line with the most recent ITU targets.
 - 95% of the population aged 15+ uses at least 4G mobile internet, in line with the most recent ITU targets.³
 - At least 70% of the population aged 15+ has basic digital skills (further details on the definition of basic digital skills are provided below).
 - At least 50% of the population aged 15+ has above basic digital skills.

Each of these targets is assumed to be met by 2030, as per the ITU aspirational targets. This provides an anchor on which to benchmark the analysis, although in practice these outcomes may materialize over a longer horizon (post-2030) for some countries, especially in remote areas.

Expanding 4G coverage to 99% of the population

The analysis applies a site-deployment algorithm to estimate the number of network sites required to extend 4G coverage to 99% of the population. The algorithm works as follows:

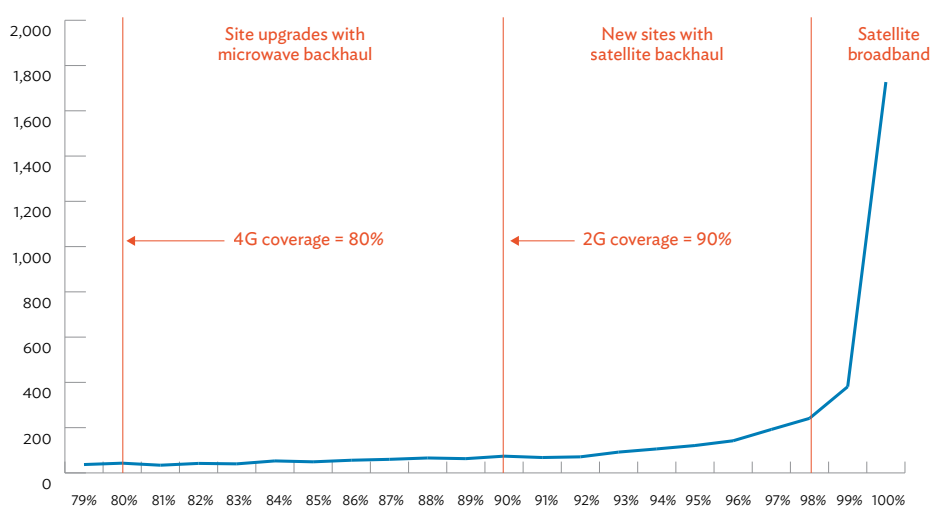
¹ ITU. 2025. *Connecting Humanity Action Blueprint*.

² ITU. n.d. *Aspirational Targets for 2030*.

³ ITU. 2025. *Connecting Humanity Action Blueprint*; ITU. 2025. *The ICT Development Index 2025*; ITU. 2025. *UMC Measurement Framework: Indicators and Targets*.

1. Starting point: Current GSMA coverage maps⁴ identify the uncovered population at 1 square kilometer (km²) grid resolution, using Global Human Settlement Layer population data.
2. Site identification: For population settlements that do not have coverage, the analysis applies an algorithm to determine the most efficient number of sites to cover the remaining uncovered population. The algorithm iterates through the uncovered population, deploying a site at the location that covers the most uncovered people within a 6-kilometer buffer radius.
3. Coverage removal: Once a site is deployed, the people it covers are removed from the uncovered pool. The algorithm then identifies the next optimal site.
4. Steps 1–3 are repeated until 99% population coverage is reached.
5. Site classification: Sites are classified as either upgrades to legacy infrastructure (for example, where 2G coverage exists but 4G does not) or new greenfield deployments (where there is no existing infrastructure at all). For existing site upgrades, it is assumed microwave backhaul is viable. For new greenfield sites, the analysis assumes satellite backhaul is required.
6. Where there are no recent coverage maps, the number of sites is estimated based on the optimal number of sites based on existing population coverage. This assumes a hypothetical list of sites is deployed in descending order in terms of the number of people covered (i.e. the operator first deploys a site that will cover most people, the second site covers the second most people etc.). If current 4G coverage is 80%, the algorithm will then identify the number of sites needed to reach 99% population coverage. Figure A1.1 provides an illustration of how the number of sites increases as coverage is extended.

Figure A1.1: Example of the Number of Sites Needed to Extend 4G Coverage



Source: GSMA Intelligence.

⁴ See GSMA. n.d. *Network Coverage Maps*.

To model the expected costs and revenues of new sites, the following assumptions are made:

- Site upgrade costs – \$40,000–\$60,000 capital expenditures (CAPEX) and \$7,000–\$10,000 operating expenditures (OPEX) (source: GSMA Intelligence). This includes the cost of new active equipment (for example, radios, antennas, and baseband units as well as additional backhaul and energy costs).
- New site costs – \$200,000–\$400,000 CAPEX and \$50,000–\$150,000 OPEX (depending on country and backhaul) (source: GSMA Intelligence). This includes the cost of passive infrastructure (e.g. site acquisition, towers, masts and civil works), backhaul, energy and active infrastructure.
- Adoption – estimated demand in rural areas is based on the existing connectivity and rural–urban gap in each country (source: GSMA Intelligence and Gallup World Poll).
- Average Revenue Per User – it is assumed that consumers will pay the price of the cheapest plan that allows 1 gigabyte (GB) monthly data access (source: GSMA Intelligence and Tarifica).
- Weighted Average Cost of Capital – 5%–20% depending on the country (source: Damodaran, NY University).

The total investment requirement is the discounted CAPEX and OPEX cost of deploying sites to achieve 99% 4G coverage. The investment gap is calculated by subtracting expected revenues from deploying the sites that are unprofitable.

Satellite broadband

For the remaining 1% of uncovered population, it is assumed each household would incur a cost of \$4,000–\$6,000 to access satellite broadband. This is sourced from the latest available Starlink broadband prices in the Developing Asia and the Pacific region, as well as estimates to provide satellite connectivity to unserved rural locations under the Broadband Equity, Access, and Deployment program in the United States.

The total investment requirement is the upfront and ongoing cost of a fixed satellite broadband service. The investment gap is calculated by subtracting the proportion of cost that consumers are able to pay, based on the affordability thresholds for devices (20% of monthly income) and recurring subscription costs (2% of monthly income).

Network capacity

Based on GSMA Intelligence financial data and forecasts, the amount of network CAPEX and OPEX that is spent on the core network (not access and backhaul) is estimated. In the long run by 2030, it is assumed these costs will increase proportionately with the increase in traffic that new mobile internet users will add to the mobile network. The costs are scaled upwards for countries that have higher transit costs or costs for international bandwidth.

In terms of the radio access network costs, the model calculates the capacity per mobile site based on current spectrum assignments and spectral efficiencies. It then uses this to determine the number of new sites that are needed to meet the increase in traffic from new mobile internet users.

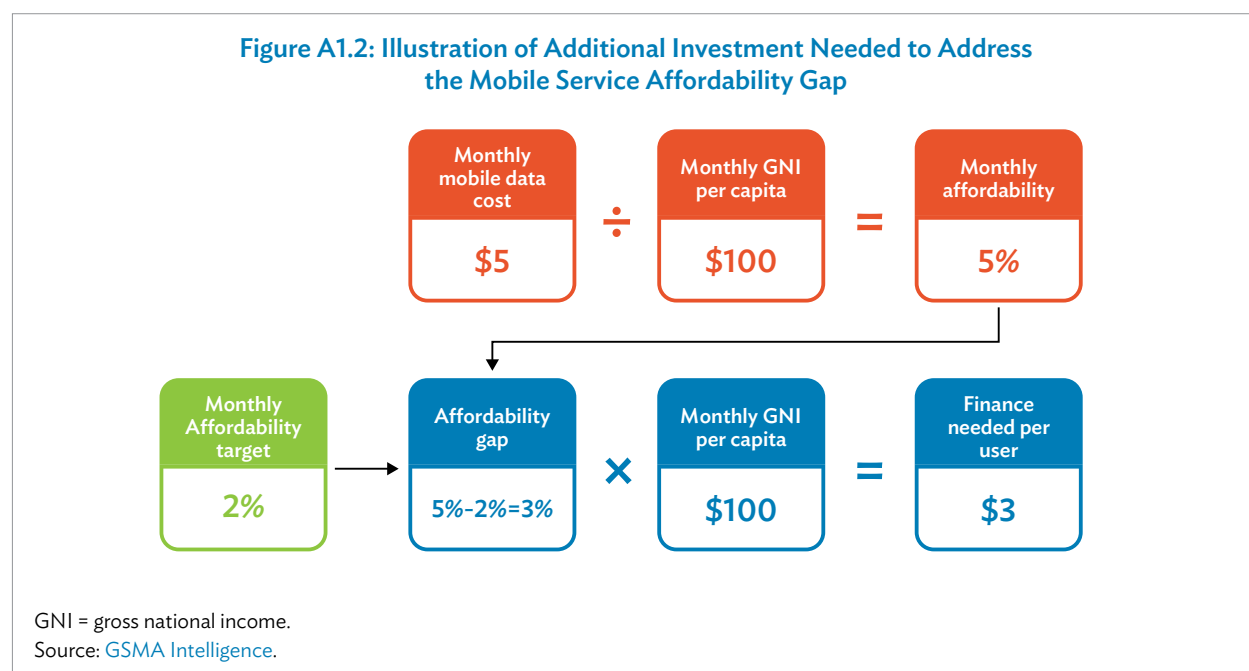
The total investment requirement is the CAPEX and OPEX of additional capacity to support 95% adult adoption of 4G mobile internet by 2030 (i.e., an increase in penetration of 27 percentage points compared to current levels). The investment gap is calculated by subtracting the capacity of the expected increase in new users (i.e., subtracting capacity costs to meet demand of an increase in 9 percentage points compared to current levels).

Mobile service and device affordability

To determine the investment needed to overcome affordability barriers, the analysis takes the following steps:

1. Assume the remaining unconnected populations by 2030 are in the poorer income groups.
2. Calculate the gross national income (GNI) per capita for each income quintile (bottom 20%, fourth 20%, middle 20%, second 20%, and richest 20%) in each country.
3. Determine the monthly cost of a mobile broadband plan as well as the one-off cost of an entry-level 4G smartphone.
4. Use an affordability threshold at which consumers have the ability to pay for a mobile plan or device.
5. If the cost exceeds the threshold, calculate the amount of financing needed.
6. Aggregate costs across all unconnected populations.

Figure A1.2 illustrates how the calculation works for one user.



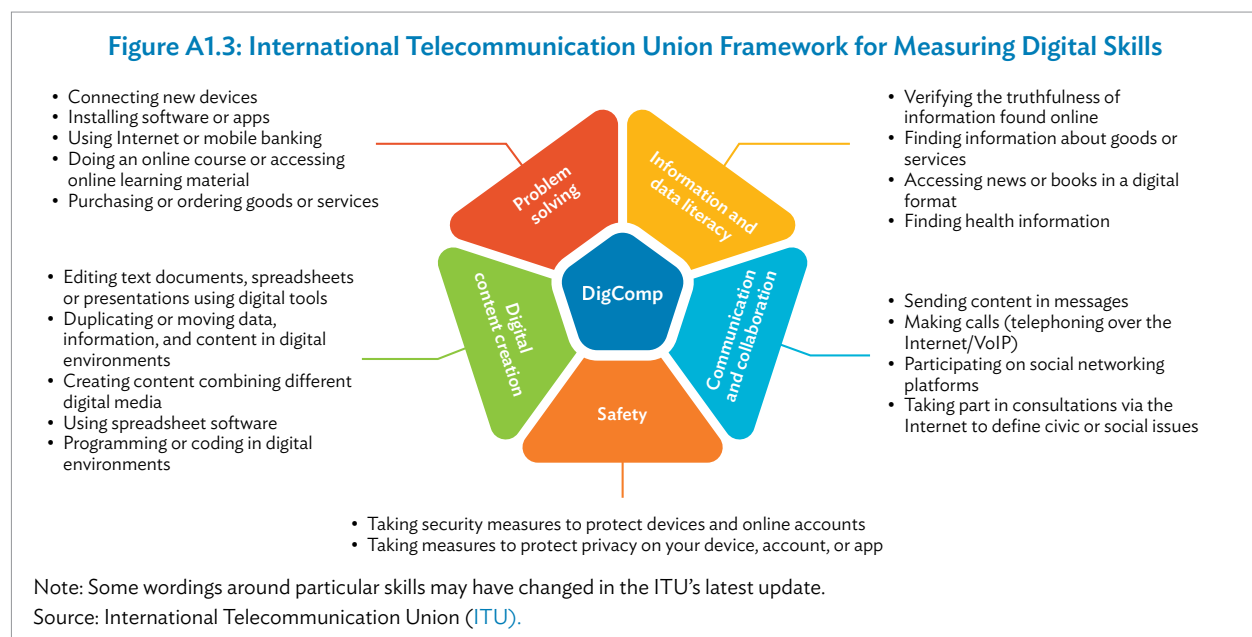
To model investment related to addressing affordability, the following assumptions are made:

- Income – the analysis uses country-level data on GNI per capita and income share by quintile.⁵
- Device cost – the analysis assumes a cost of \$100 for an entry-level device, with sensitivity analysis carried out for lower costs. This captures both the retail price as well as additional costs for marketing, onboarding, and customer acquisition.
- Mobile service cost – cost of purchasing 5 GB of monthly data, with sensitivity for 1 GB and 20 GB prices.⁶
- Target affordability for device – 20% of monthly GNI per capita.⁷
- Target affordability for mobile services – 2% of monthly GNI per capita.⁸

The total investment requirement is the total cost of the device and monthly subscription costs for all new 4G+ mobile internet users. The investment gap subtracts the proportion of these costs that consumers are able to pay, based on the affordability thresholds (in the illustration in Figure A1.2, the total investment would be \$5, while the investment gap would be \$3).

Digital skills

Information and communication technology (ICT) skills are measured by the ITU based on whether an individual has recently performed certain activities that require a degree of proficiency in the relevant skills. These ICT skills are grouped into five areas, identified in Figure A1.3.



⁵ World Bank for current data and IMF for forecasts.

⁶ Tarifica.

⁷ GSMA Intelligence analysis, also aligned with ITU Connecting Humanity study.

⁸ Based on ITU affordability target.

Basic skills are defined as having undertaken one activity in a particular skill area, while **above basic skills** are defined as having undertaken two or more activities in a particular skill area. An individual is considered to have undertaken an activity if they have done so in the last 3 months, independent of the device(s) used. No skills are defined as not having undertaken any activity in a particular skill area.

While the importance of digital skills in leveraging ICTs for economic prosperity and social wellbeing is well documented, data remains very limited. Only 88 countries have submitted data to the ITU since 2020, and rarely for all skill areas. 48 countries provided comparable data on ICT skill levels and only eight provided data on overall skill levels.

Given the lack of data on digital skills, the following proxies are used:

- The proportion of adult population without basic skills is the minimum of: (i) the illiteracy rate in the country, and (ii) a multiplier of existing mobile internet users. For the latter, a multiplier of 0.7 is used, based on ITU research that estimates the proportion of internet users in low- and middle-income countries that do not have basic skills. So if 50% of the population are mobile internet users, the proportion of population with basic skills would be $50\% \times 0.7 = 35\%$.
- The proportion of adult population without above basic skills is the proportion of adult population that has not completed a secondary education.

Once the estimates of adult population without basic and above basic skills are calculated, the analysis estimates the costs needed to ensure 70% have at least basic and 50% have above basic skills, in line with the ITU targets. The cost methodology works as follows, leveraging a similar methodology to the ITU Connecting Humanity methodology:⁹

- Assume a trainer will train in groups of 20 people.
- Assume basic skills requires 40 hours of training and above basic skills requires 80 hours of training.
- Hourly training cost based on average hourly cost of training professional (sourced from International Labour Organization).
- Assume each trainee receives a stipend, based on average hourly wage of the bottom 50% of the population (sourced from International Labour Organization). Attendees receive a stipend for each hour of training.

For basic skills, the methodology gives an average one-off cost of around \$40 per person trained, while for basic skills it gives an average one-off cost of around \$70 per person trained. A sensitivity analysis is undertaken to determine the investment requirement if these costs are halved, as they will change with assumptions such as training time, trainer costs, and delivery channel. For this calculation, it is assumed that the investment requirement is the same as the investment gap, as the increase in skills in the internet adoption forecasts are already accounted for, and therefore the investment costs reflect the gap to meet the ITU targets.

⁹ For further details, see ITU. 2025. *Connecting Humanity Action Blueprint*.

Appendix 2

Analysis of Digitalization Clusters

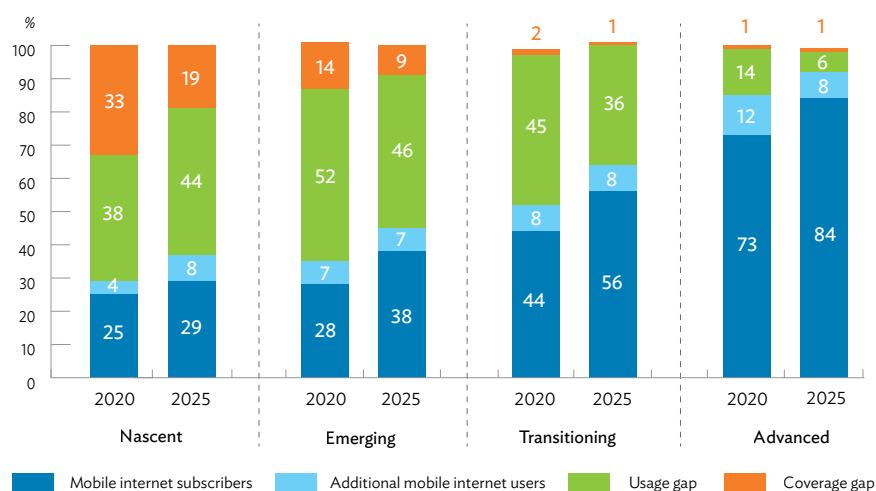
This appendix sets out analysis for the digitalization clusters defined in Chapter 1.

State of connectivity

Figure A2.1 shows there is a significant gap between the advanced markets (People's Republic of China, Malaysia, and Türkiye), where 93% of the population use mobile internet, and the nascent markets, where 37% are connected. The latter group also has a much larger coverage gap, with almost one in five people lacking mobile broadband coverage, while in the emerging cluster of markets 9% do not have broadband coverage. While significant, the usage gap is nevertheless notably higher than the coverage gap in each cluster, highlighting the common challenge each country faces in terms of increasing usage for those that already have coverage.

Figure A2.2 highlights the lack of 5G networks in nascent and emerging markets as well as the larger 4G coverage gaps, while transitioning and advanced markets have much greater levels of 4G and 5G coverage. Reflecting on the latter, Figure A2.3 shows that feature phones and 3G smartphones account for half of mobile internet access in nascent countries and around 20% in emerging markets, while they only account for 7% of mobile internet access in transitioning markets and 3% in advanced markets.

Figure A2.1: Mobile Internet Connectivity by Digitalization Cluster, 2020–2025

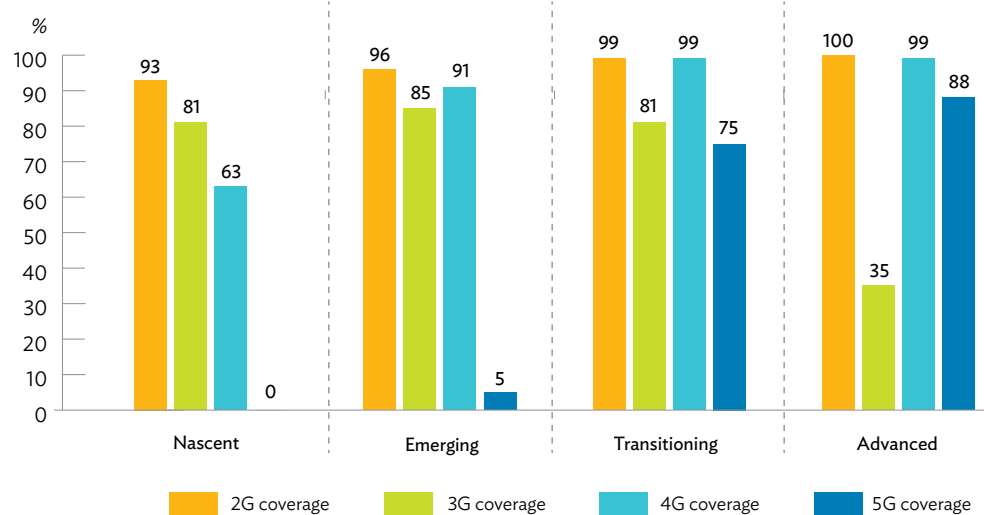


Base: Total population.

Note: Totals may not add up due to rounding.

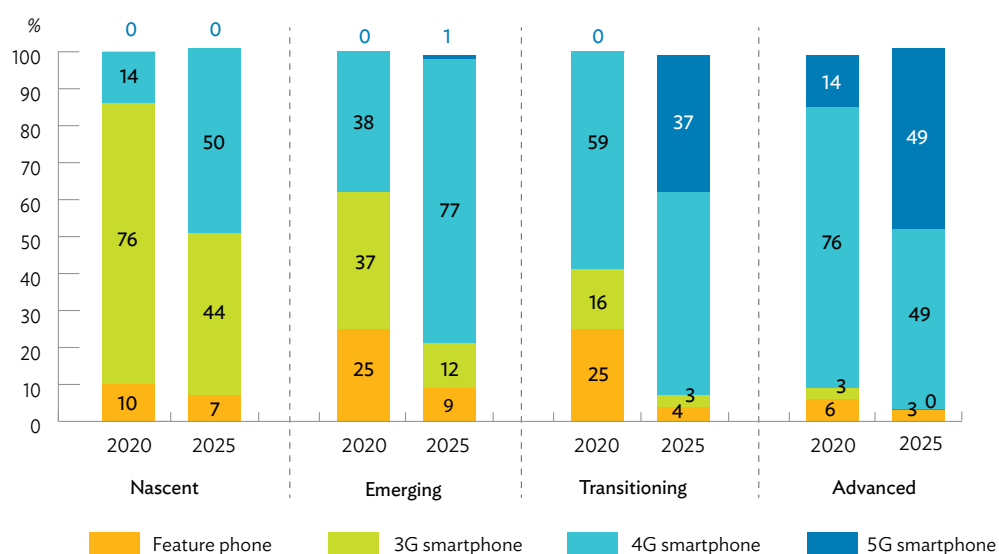
Source: Unique subscriber data is sourced from GSMA Intelligence to 2025. Coverage data is sourced from GSMA Intelligence, combining data reported by mobile operators and national regulatory authorities. Population data are sourced from the [UN](#).

Figure A2.2: Population Coverage by Digitalization Cluster, 2025
(%)



Source: GSMA Intelligence to 2025.

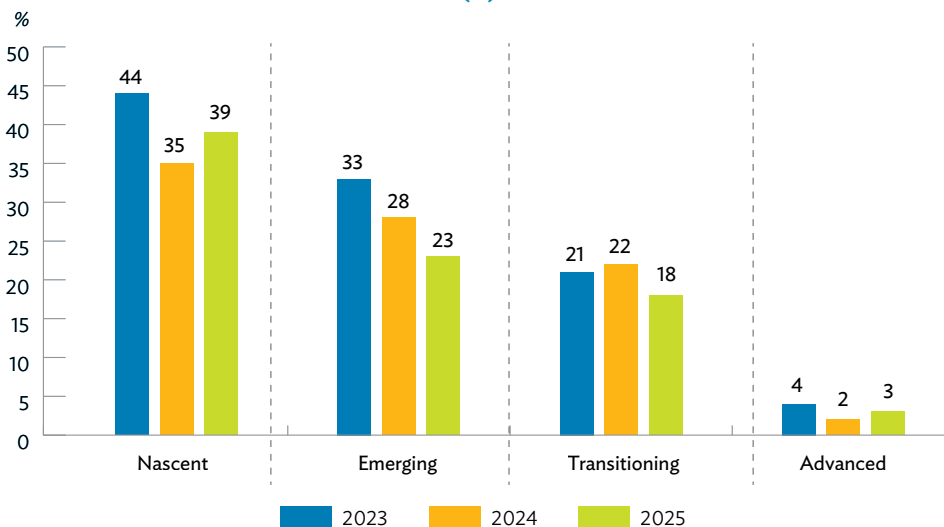
Figure A2.3: Distribution of Devices Used by Mobile Internet Subscribers Based on Digitalization Cluster, 2020–2025
(%)



Source: GSMA Intelligence to 2025.

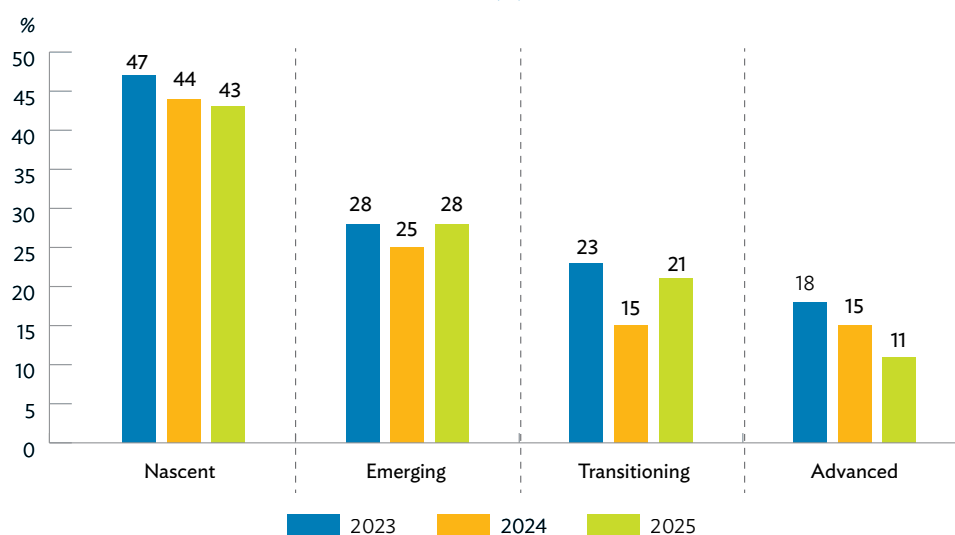
In terms of the gender and rural gap, Figures A2.4 and A2.5, respectively, show these by digitalization cluster. The gender gap decreases with country digitalization, with nascent markets having a gender gap of 39% and the advanced markets having a gender gap of 3%. In terms of the rural–urban gap, while this is highest for nascent markets, it remains significant for both transitioning and advanced markets at 22% and 11%, respectively.

Figure A2.4: Gender Gap in Mobile Internet Adoption by Digitalization Cluster, 2023–2025
(%)



Source: GSMA Intelligence analysis of modeling; GSMA. 2026. *State of Mobile Internet Connectivity Report 2026*.

Figure A2.5: Rural–Urban Gap in Mobile Internet Adoption by Digitalization Cluster, 2022–2024
(%)

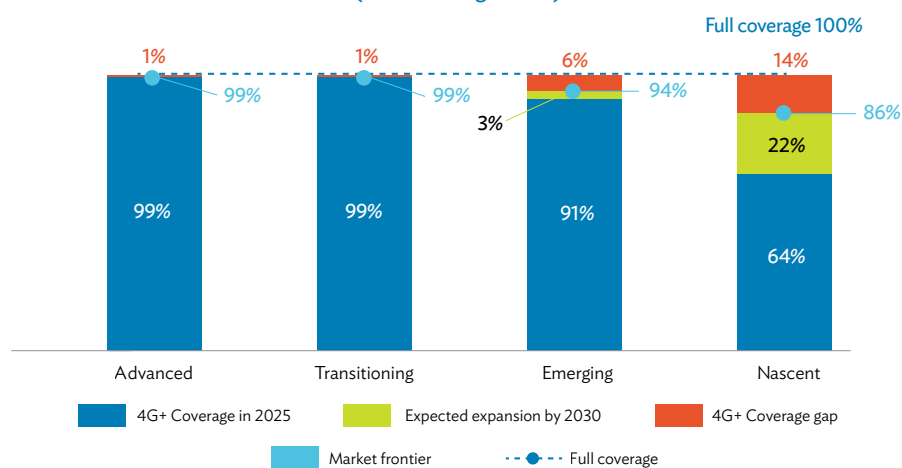


Source: GSMA Intelligence analysis of modeling; GSMA. 2026. *State of Mobile Internet Connectivity Report 2026*.

Market frontier, coverage and usage gaps by 2030

Figure A2.6 presents expected 4G population coverage by 2030 by digitalization cluster, with a 1% 4G coverage gap expected in advanced and transitioning markets, 6% in emerging and 14% in nascent markets. Figure A2.7 shows that the usage gaps will be 40% and 64% for emerging and nascent markets, respectively, 24% for transitioning markets and only 1% for the advanced cluster.

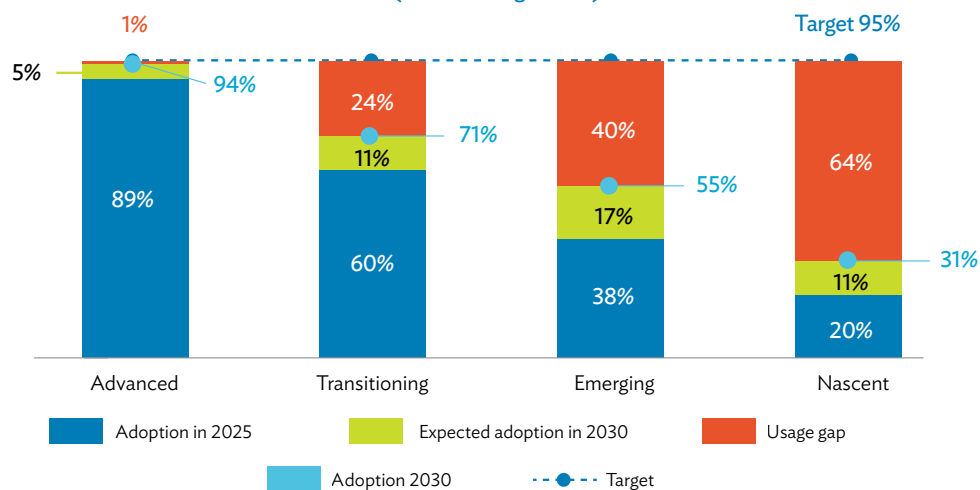
Figure A2.6: Expected 4G Population Coverage by 2030 by Digitalization Cluster
(for adults aged 15+)



Note: Coverage gaps may appear slightly different to the analysis in Chapter 2 as the base population only considers adults aged 15+ rather than total population. This means that coverage gaps by digitalization cluster can decrease (increase) if markets with high coverage gaps based on total populations have a relatively larger (smaller) proportion of population aged below 15.

Source: GSMA Intelligence modeling.

Figure A2.7: Expected 4G Adoption and Usage Gap by 2030 in Digitalization Clusters
(for adults aged 15+)

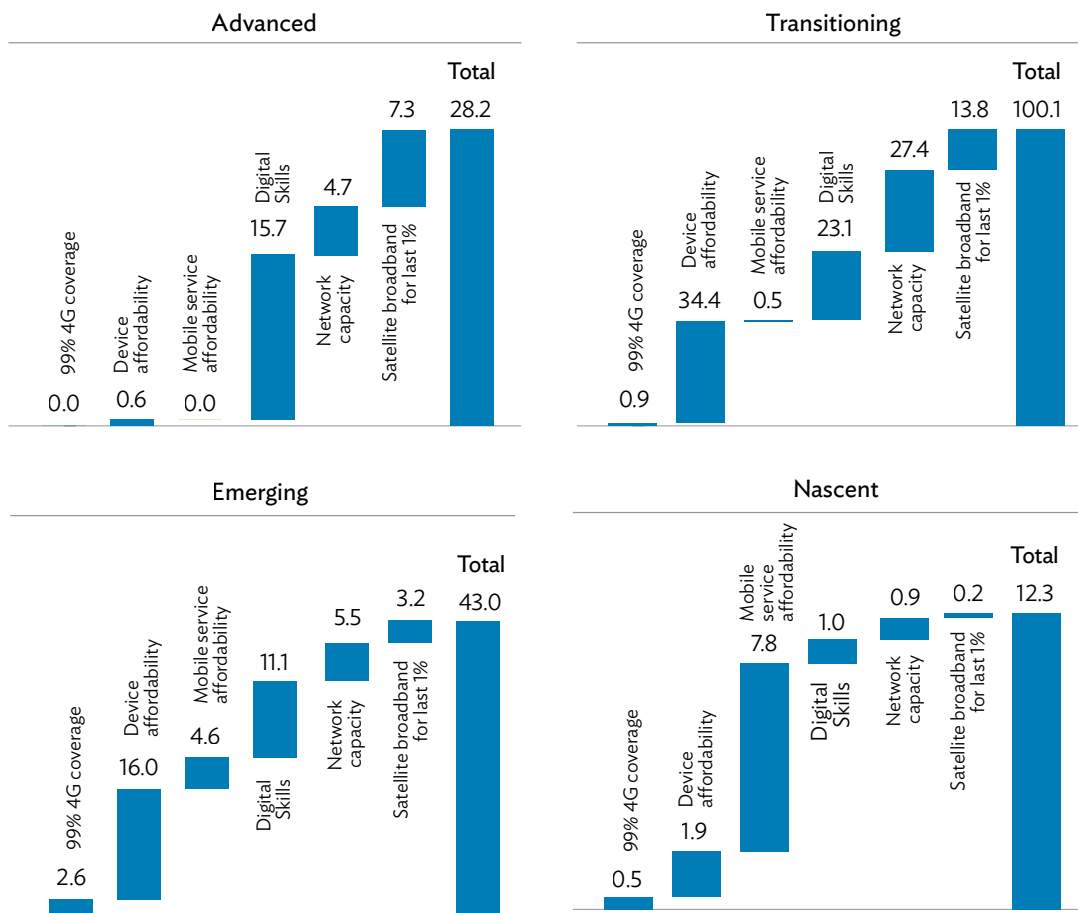


Source: GSMA Intelligence modeling.

Investment gap

Figure A2.8 presents the investment gap breakdowns by digitalization cluster. In advanced markets, digital skills account for the largest proportion of investment gap, followed by satellite broadband access for the last 1% and network capacity. In transitioning and emerging markets, device affordability and digital skills account for more than half the investment gap, though in emerging markets there is a significantly greater amount of investment needed in mobile service affordability, whereas transitioning countries generally require more investment in network capacity. In nascent markets, the biggest investment gap is in mobile service affordability. Both emerging and nascent markets have a greater share of investment needed to reach 99% 4G coverage, due to the larger coverage gaps in the two clusters.

Figure A2.8: Investment Gaps by Barrier in Digitalization Clusters
(\$ billion, 2025 prices)



Source: GSMA Intelligence modeling.

Appendix 3

Glossary

2G	Short for second-generation wireless telephone technology. Second-generation 2G cellular telecoms networks were commercially launched on the GSM standard.
3G	The third-generation of mobile telecommunications technology. This is based on a set of standards used for mobile devices and mobile telecommunications use services and networks that comply with the International Mobile Telecommunications-2000 (IMT-2000) specifications by the International Telecommunication Union. 3G finds application in wireless voice telephony, mobile internet access, fixed wireless internet access, video calls, and mobile television.
4G	Short for fourth-generation, is the fourth generation of mobile telecommunications technology, succeeding 3G and preceding 5G. A 4G provides mobile broadband internet access and over some networks voice services (known as VoLTE). Potential and current applications include amended mobile web access, IP telephony, gaming services, high-definition mobile television, video conferencing, 3D television, and cloud computing
5G	The fifth generation mobile networks or 5th generation wireless systems denotes the next major phase of mobile telecommunications standards beyond the current 4G/IMT-Advanced standards. 5G has speeds beyond what 4G can offer.
Blended finance	Blended finance refers to a mix of public or donor money and private investment. The public money reduces risk so private companies are more willing to invest.
Connected	“The connected” or “connected population” refers to people who have used mobile internet in the last 3 months. “The unconnected” refers to those who do not use mobile internet.
Concessional funding	Concessional funds refer to funding by donors based on cheap loans and/or long repayment periods.
Coverage	“Population coverage” is the share of the population that lives in an area where the signal provided by a mobile network is strong enough to use telecoms services (voice, short messaging, data). ^a The coverage levels provided by 2G, 3G or 4G networks are independent from each other.
Coverage gap	Populations who do not live within the footprint of a mobile broadband network.
Device	A device that is used to access the internet. This can include a mobile phone, tablet, laptop or PC. In this report, the term “device” generally refers to a mobile phone, given the vast majority of internet users in LMICs are accessing it through a mobile phone and the vast majority of users in high-income countries also do so (often in addition to other devices such as tablets, laptops and PCs).
Feature phone	A mobile handset that allows basic access to internet-based services but on a closed platform that does not support a broad range of applications. The handset supports additional features such as a camera and the ability to play multimedia files such as music and video.
Grant	Funding that does not need to be repaid.
Guarantee	A guarantee refers to a donor (or government) agreeing to cover financial losses if a project fails or does not generate a positive return. A partial guarantee means they will cover part of the loss.
Landlocked developing country (LLDC)	A country classified as landlocked and developing by the United Nations. ^b

Least developed country (LDC)	A country classified as low-income that is facing severe structural impediments to sustainable development. It is highly vulnerable to economic and environmental shocks and has low levels of human assets.
Low- and middle-income country (LMIC)	A country classified as low income, lower-middle income and upper-middle income by the World Bank Country and Lending Groups.
Mobile broadband	3G, 4G, or 5G technologies.
Mobile connection	A unique subscriber identity module (SIM) card (or phone number, where SIM cards are not used) that has been registered on a mobile network. Connections differ from subscribers in that a unique subscriber can have multiple connections.
Mobile internet subscriber	Individuals who use mobile internet on a device they own or have primary use of. This is distinct from connections as an individual or a “unique subscriber” can have multiple connections or SIM cards. To estimate the number of unique subscribers by country, GSMA Intelligence leverages mobile connections data reported by mobile operators and national regulators along with the annual GSMA Consumer Survey as well as other third-party information and communications technology surveys. These are analyzed to calculate mobile subscriber, mobile internet and smartphone penetration. The GSMA Consumer Survey is used as a benchmark for different regions around the world, taking into account macroeconomic indicators and growth potential, and current mobile use cases.
Mobile internet user	A person who uses internet services on a mobile device. Mobile internet services are defined as any activities that use mobile data.
Additional mobile internet user	Individuals who use mobile internet on a device they do not own or have primary use of.
Mobile (phone) owner/subscriber	A person who subscribes to any mobile service, including voice and SMS. They do not necessarily use mobile internet.
Small island developing state (SIDS)	A country classified as a small island and developing state by the United Nations. ^c
Smartphone	A mobile handset enabling advanced access to internet-based services and other digital functions. Smartphone platforms, such as Android and iOS, support a broad range of applications created by third-party developers.
Usage gap	Populations who live within the footprint of a mobile broadband network but do not use mobile internet.

^a For further details on different technologies, see ITU. 2022. [ITU-R FAQ on International Telecommunications \(IMT\)](#).

^b United Nations. n.d. [List of LLDCs](#).

^c United Nations. n.d. [List of SIDS](#).

Closing the Mobile Connectivity Gap in Developing Asia and the Pacific

Achieving universal mobile connectivity in developing Asia and the Pacific presents formidable challenges. Though 77% of adults in the region will be connected to the mobile internet via 4G or 5G by 2030, a usage gap will remain hindering prospects for economic growth. Achieving universal mobile connectivity will require closing an investment gap of around \$184 billion. Nonetheless, the economic case for closing the connectivity gap is compelling, with an uplift of around \$230 billion. Financing from external investors, including multilateral development banks and other development partners, will be needed to support these efforts.

About GSMA Intelligence

GSMA Intelligence is the definitive source of global mobile operator data, analysis and forecasts, and publisher of authoritative industry reports and research. Our data covers every operator group, network and Mobile Virtual Network Operator (MVNO) in every country worldwide—from Afghanistan to Zimbabwe. It is the most accurate and complete set of industry metrics available, comprising tens of millions of individual data points, updated daily.

GSMA Intelligence is relied on by leading operators, vendors, regulators, financial institutions and third-party industry players, to support strategic decision-making and long-term investment planning. The data is used as an industry reference point and is frequently cited by the media and by the industry itself.

Our team of analysts and experts produce regular thought-leading research reports across a range of industry topics.

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