



The Mobile Economy

Pacific Islands

2019



GSMA[®] Intelligence

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Executive Summary





The ongoing shift to mobile broadband and digital transformation

Mobile technology can play a pivotal role in the digital transformation of the Pacific Islands, enabling access to life-enhancing services in areas such as health and education, while proving a catalyst for innovation and economic growth, with the promise of new jobs and increased tax revenues.

The Pacific Islands region is seeing only modest mobile subscriber growth at a time when subscriber penetration rates remain well below regional and global developed-market averages. Although 38% of the population subscribed to a mobile service as at the end of 2018, this trails the average for least developed countries (44%). Within the region, there is significant variation in the development of local mobile markets; subscriber penetration rates range from a high of 84% in Fiji to a low of just 11% in the Marshall Islands. Papua New Guinea is by some way the most populous country in the region; with a subscriber penetration rate of 30%, it is home to the majority of the unconnected population across the region.

Operators are investing to improve LTE network coverage and speeds. 4G connections are set to account for more than half of total connections by 2023, doubling the figure from the end of 2018. The shift to mobile broadband and 4G also reflects the increasing rates of smartphone adoption. From just 30% of connections at the end of 2018, this is forecast to more than double to 65% by 2025, helped by declines in smartphone prices and the emergence of new, low-cost smartphone vendors.

Faster network speeds and more advanced devices are key to bringing populations online. At the end of 2018, mobile internet penetration in the Pacific Islands was the lowest of any region in the world, at just 18% of the population. This figure will grow over the coming years, but by 2025 only a third of the population will have mobile internet access. This will leave more than 9 million people across the region offline, limiting their ability to participate in the digital economy and take advantage of the opportunities it can offer.



Infrastructure challenges remain

Many countries in the region face issues around infrastructure – one of the GSMA Mobile Connectivity Index's four key enablers of mobile internet and a contributor to the connectivity gap in the region. Factors behind this challenge include the fact that numerous countries have yet to complete the digital switchover process and are therefore yet to allocate spectrum in the digital dividend band (700 MHz) to mobile services. In addition, the scarcity of international internet bandwidth is a key limiting factor only gradually being addressed as new submarine cables improve connectivity.

There is growing support for innovation across the region, with the emergence of new tech hubs and a developing ecosystem of entrepreneurs and new ventures looking to adapt emerging technologies such as blockchain to the particular challenges of the Pacific Islands. Most islands still lack properly developed innovation ecosystems due to the limited size of the individual markets, the complexity of developing sound infrastructure between the archipelagos, and the significant leverage of larger regional hubs in Asia Pacific.



Mobile helping to boost financial inclusion

Financial inclusion remains a challenge across all areas of the Pacific Islands. However, initiatives at a regional and country level have made some progress in recent years. The Pacific Financial Inclusion Programme (PFIP) was launched in 2008 and has funded 44 projects with financial service providers who have innovated with technology and products, in the process helping more than 2 million Pacific Islanders access formal financial services.

Mobile has a key role to play in facilitating the adoption of financial services in many developing regions. Today there are a total of nine live mobile money services available to the unbanked in six different countries across the Pacific region: two in Fiji, three in Papua New Guinea and one in each of Samoa, the Solomon Islands, Tonga and Vanuatu. There are high levels of registration on some islands: 51% of the combined adult population of Fiji, Samoa, Solomon Islands and Tonga have a mobile money account. However, activity levels remain low, with less than 10% of these accounts currently active.



Unlocking the full potential of mobile

To unlock the full potential of existing and future mobile networks, access to sufficient spectrum for better coverage and capacity is a necessity. When licensing spectrum, the priority for governments and regulators should be to support affordable, high-quality mobile services. One of the best opportunities for collaboration is the World Radiocommunication Conference of the ITU.

At WRC-19, the future success of 5G is at stake, since the decision for mmWave bands will be taken at the conference. This is not just for countries where 5G is rolling out in the next couple of years, but for everyone. The spectrum assignment process is a long-term effort. Spectrum identified at WRC-19 can be used for decades to come: it is important to shape 5G today.

The GSMA recently published a report on the socio-economic benefits of 5G services provided in mmWave bands. Rolling out 5G using mmWave is an opportunity to radically reshape services such as ultra-high

speed broadband, industrial automation and intelligent transport systems. It can help provide access to better healthcare, move virtual and augmented services to the mainstream, and improve public safety.

While the Pacific Islands region might not be one of the first to roll out 5G services, supporting an IMT identification during WRC-19 offers regulators the flexibility to make mmWave spectrum available for mobile services if and when needed. This additional flexibility will allow the Pacific Islands to benefit from a mature ecosystem and massive economies of scale to see 5G develop in the same way as LTE has done in the region. New submarine cables with improved capacity and other technical advancements are setting the stage for advanced broadband services, including 5G.

There are several common themes to the challenges of addressing the digital divide in the region, including access to internet connectivity, financial services and other

life-enhancing digital products and services. The often challenging natural environment and topography are limiting factors on the provision of mobile coverage or access to other basic services, while low population densities and relatively modest population totals mean operators and other ecosystem players often struggle to scale new services and deployments in a cost-effective manner.

Addressing these will require collaboration between players from across the mobile ecosystem, as well as a supportive regulatory and policy environment that encourages investment and innovation. A number

of bodies including the World Bank and the GSMA are highlighting the importance of collaboration and harmonisation in various areas of both telecoms and broader ICT regulation.

The ITU has previously suggested that the Pacific Islands could become a showcase for developing a 'collaborative framework' – a call that resonates beyond just the mobile sector to encompass all developmental initiatives in the region. The goal of increased collaboration is one that all players in the Pacific Islands should support with the aim of increasing connectivity and realising the potential of the digital economy.

Pacific Islands

Unique mobile subscribers



2018

4.5m



38%

PENETRATION RATE
(% of population)

44%

CAGR
2018-25

5.8m

2025

3.7%



Mobile internet users



2018

2.1m



18%

PENETRATION RATE
(% of population)

33%

CAGR
2018-25

4.4m

2025

11.1%



SIM connections

Excluding cellular IoT



5.9m

2018

7.5m

2025



3.5%



CAGR
2018-25

50%

PENETRATION RATE
(% of population)

57%

Revenues



2018

\$1.14bn



2025

\$1.22bn

CAGR 2018-2025

1.0%

The Pacific Islands



| 2018 | Population (000) | Unique subscribers (000) | Connections (000) | Subscriber penetration |
|-------------------------------|------------------|--------------------------|-------------------|------------------------|
| American Samoa* | 56 | 30 | 40 | 55% |
| Cocos (Keeling) Islands | 0.6 | 0.2 | 0.3 | 38% |
| Cook Islands | 17 | 5.6 | 6 | 32% |
| Fiji | 915 | 770 | 1,192 | 84% |
| French Polynesia* | 287 | 163 | 294 | 56% |
| Guam* | 166 | 109 | 179 | 65% |
| Kiribati | 119 | 22 | 56 | 19% |
| Marshall Islands | 53 | 6 | 6 | 11% |
| Micronesia (Federated States) | 107 | 18 | 24 | 17% |
| Nauru | 11 | 7 | 11 | 61% |
| New Caledonia* | 282 | 186 | 276 | 66% |
| Niue | 1.6 | 1 | 1.5 | 58% |
| Norfolk Island* | 2 | 1 | 1.6 | 47% |
| Northern Mariana Islands* | 55 | 23 | 35 | 41% |
| Palau | 22 | 15 | 26 | 67% |
| Papua New Guinea | 8,502 | 2,525 | 2,734 | 30% |
| Samoa | 198 | 93 | 142 | 47% |
| Solomon Islands | 629 | 310 | 459 | 49% |
| Tokelau* | 1.3 | 1 | 1 | 52% |
| Tonga | 109 | 68 | 110 | 62% |
| Tuvalu | 11 | 3 | 4 | 24% |
| Vanuatu | 285 | 163 | 330 | 57% |
| Wallis And Futuna Islands* | 11 | 6 | 8 | 50% |

Source: GSMA Intelligence

*Dependent territories rather than independent states



01 Industry overview

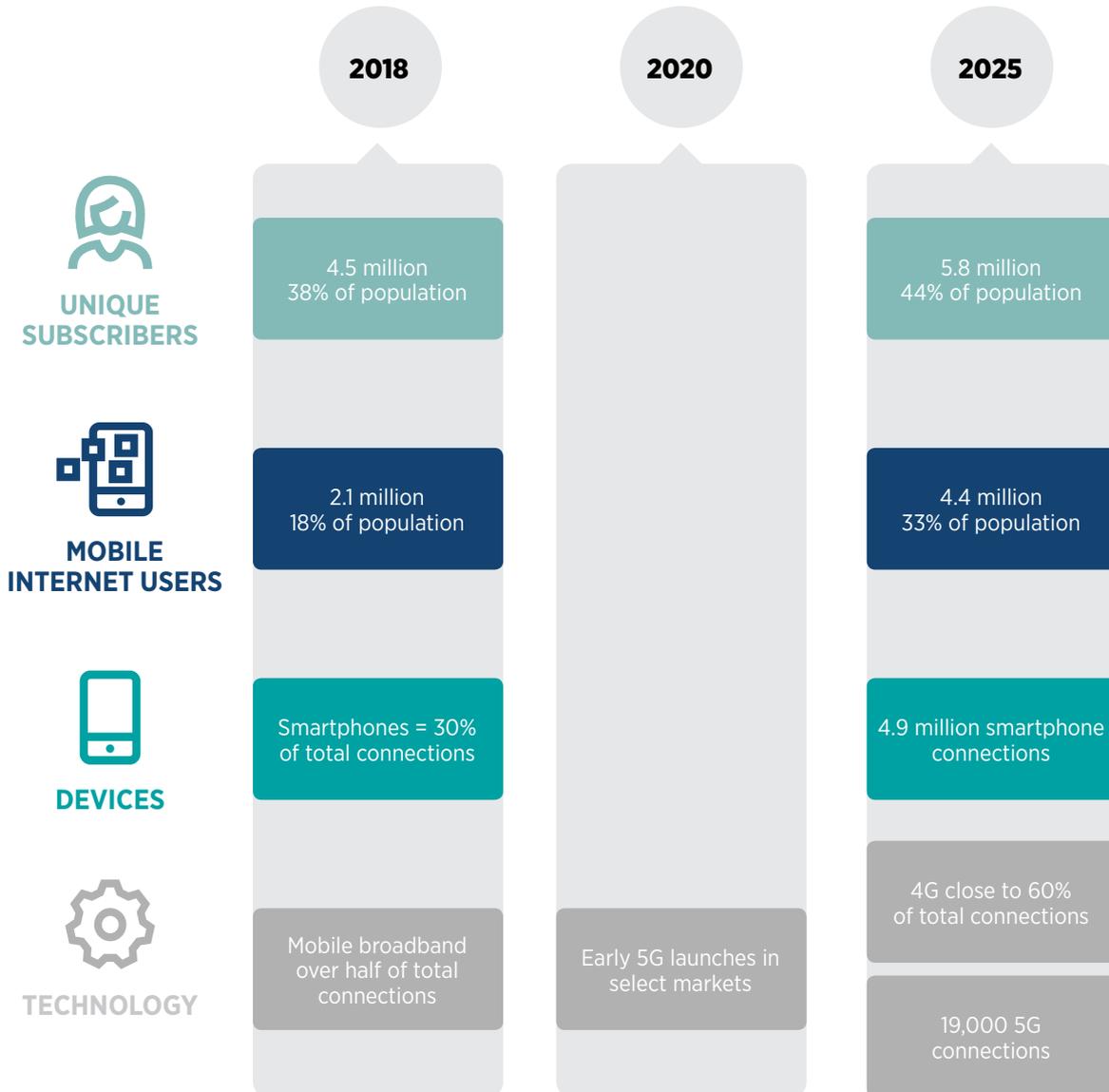


1.1 Mobile market: ongoing shift to mobile broadband

Figure 1

Source: GSMA Intelligence

Mobile market milestones for the Pacific Islands



The Pacific Islands region is seeing only modest subscriber growth at a time when penetration rates remain well below regional and global developed-market averages. Although 38% of the population subscribed to a mobile service at the end of 2018, this trails the broader south-east Asia

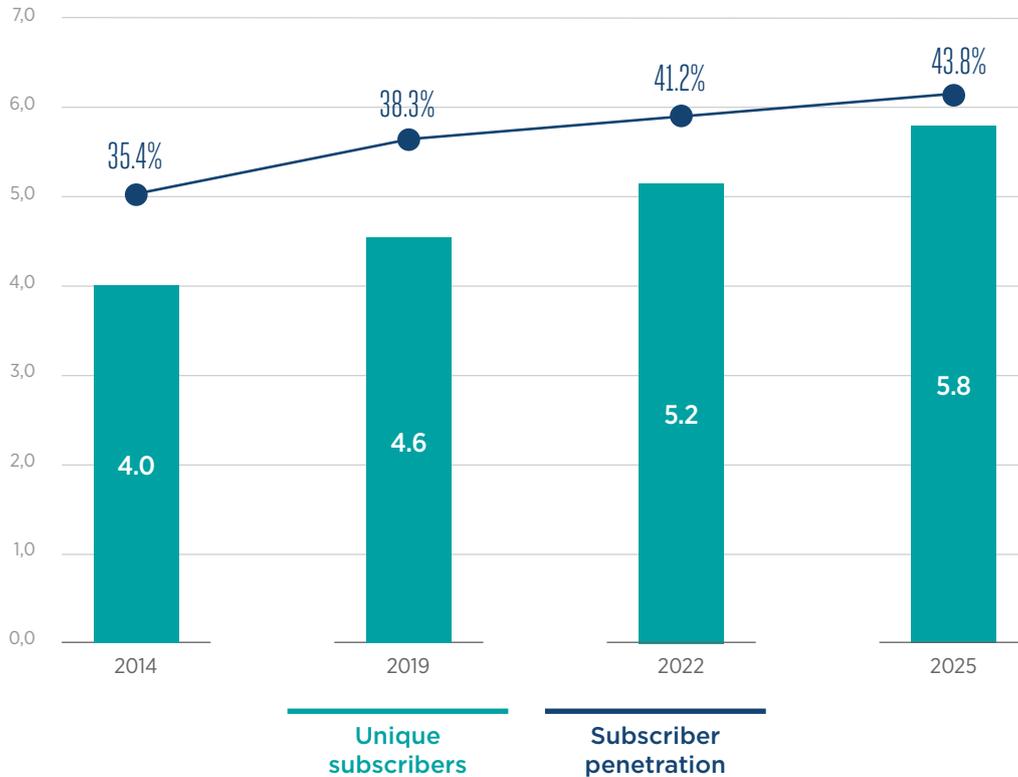
Pacific regional average (68%). The gap will remain largely unchanged by the end of the forecast period: by 2025, the Pacific Islands will have seen only a modest increase in penetration rates to reach 44% of the population.

Figure 2

Source: GSMA Intelligence

Subscriber penetration in the Pacific Islands

Millions



Within the region, subscriber penetration rates range from a high of 84% in Fiji to a low of just 11% in the Marshall Islands. Papua New Guinea is by some way the most populous country in the region. Its current subscriber penetration rate of 30% means it is home to the majority of the unconnected population across the region. Connecting these still unconnected populations remains the key challenge for operators and other industry stakeholders in the region, including governments and regulators.

The region is seeing an ongoing shift to mobile broadband connections (3G and 4G capable devices), which by the end of 2018 already account for more than half the connections base. 4G alone is set to account for over half of total connections by 2023 – more than doubling the figure from the end of 2018.

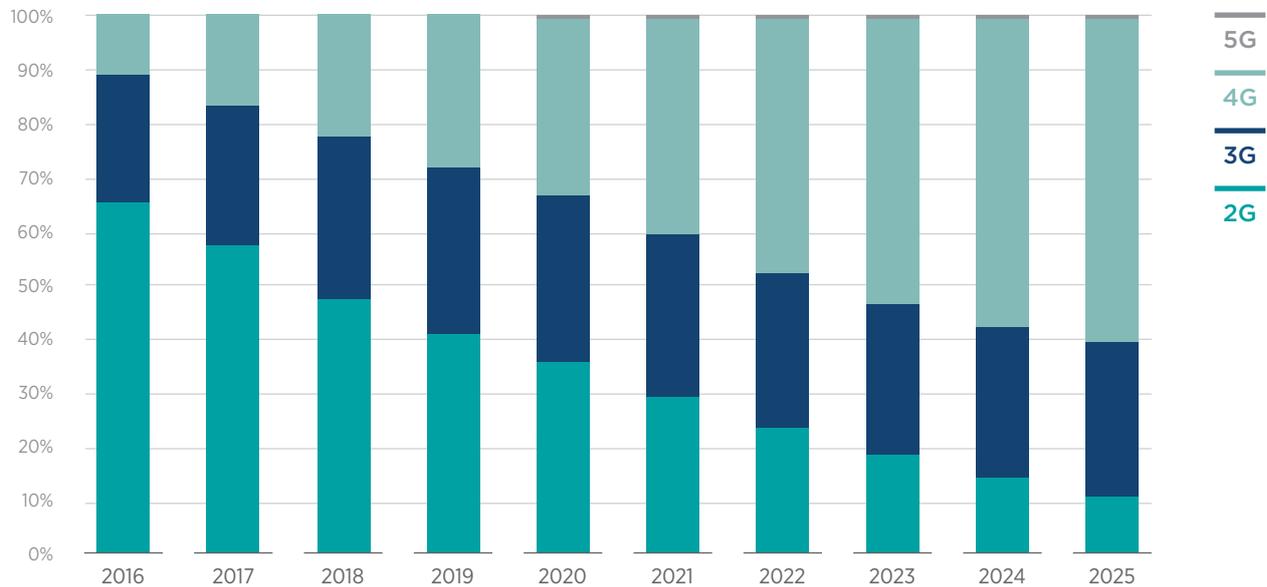
There are now 34 LTE networks in service across the region. Most recently, Tuvalu Telecom launched on the island of Tuvalu in 2018. Operators are continuing to invest in expanding their existing networks, in terms of coverage and network speeds. For example, Vodafone Fiji announced in 2018 its plans to invest FJD207 million (\$98.6 million) in the upgrade of its mobile networks, with the goal of raising '4G+' coverage to more than 90% of the population. Around 100 existing 3G cell sites will be converted to LTE-A technology, while a further 244 new sites will be developed to increase 4G coverage and network speeds. Similarly, Digicel announced a \$50 million plan to improve LTE-A coverage for key population areas in Fiji.

Figure 3

Source: GSMA Intelligence

Migration to mobile broadband

Percentage of total connections



The shift to mobile broadband reflects the increasing rates of smartphone adoption. From just 30% of connections at the end of 2018, smartphone adoption is forecast to more than double to reach 65% by 2025. The average selling price of smartphones fell below \$120 in many low-income markets around the world in 2018. There is also a growing range of sub-\$100 smartphones, mostly from Asian manufacturers such as Gionee

and Tecno. Other innovative new players looking to bring more affordable devices to low-income populations include the Australian company MINTT. The company launched its first devices in Papua New Guinea in late 2017, priced below many feature phones while offering a device that is 4G compatible and has a full metal case, fingerprint scanner and glass screen.

1.2

Market structure: challenges of fragmentation and lack of scale

The highly fragmented nature of the region, with small population totals and low population densities, makes it difficult for individual mobile markets to support more than two mobile operators. A recent study by the GSMA on mobile markets in Central America suggested that the most favourable market structure for promoting investment and innovation is one with two or three mobile operators and EBITDA margins in the range of 32-38%.¹

Of the region's 23 countries and territories, 13 have only one active mobile operator, while only five have three or more operators. Across the region, there is an average of 1.7 operators per market.

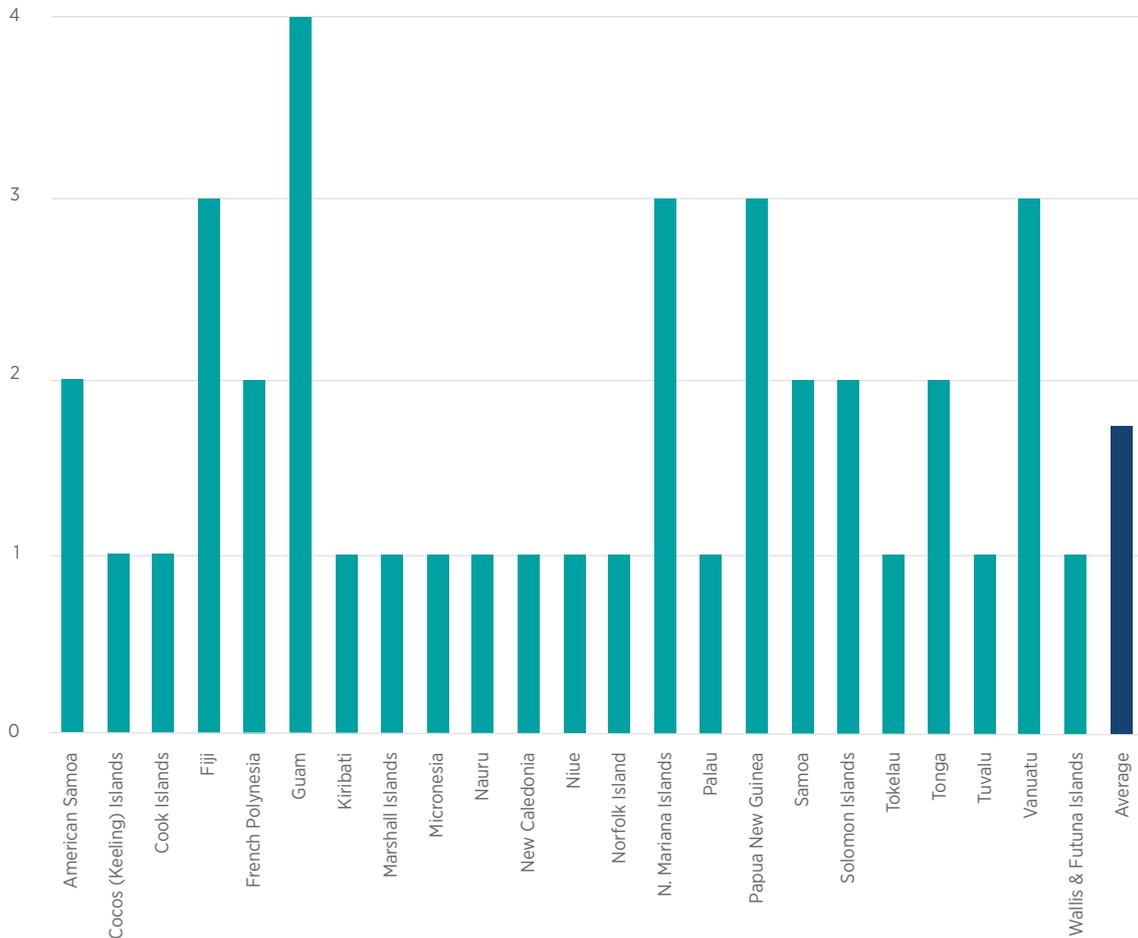
Telecom Fiji has launched mobile services in 2016 following the government's aim to increase competition and investment in the island's telecoms industry. Fiji now has the highest subscriber penetration rate in the region; this has increased by around 10 percentage points since the end of 2015. It follows earlier moves to liberalise other markets in the region: Vanuatu and the Solomon Islands have liberalised their markets in recent years and have seen the arrival of new-entrant mobile operators.

1. [Assessing the impact of market structure on innovation and quality](#), GSMA Intelligence, 2018

Figure 4

Source GSMA Intelligence

Number of mobile operators per country



Other attempts at market liberalisation in the region have proved less successful. The Marshall Islands was identified by the World Bank in 2013 as one of the least connected communities in the world. It was subsequently awarded funding from the World Bank to improve internet and mobile services. The Bank programme goals included the issuance of a second mobile licence as part of broader efforts to increase competition and private sector investment. However, the initial programme failed in a number of its objectives, with the Marshall Islands to date only having one mobile operator and a penetration rate at the end of 2018 of just 11%. This is by some distance the lowest in the region.

As well as lack of scale at an individual country or territory level, few operators have achieved scale through the development of a regional footprint. Digicel is present in six markets across the region, with a total connections base at the end of 2018 of 3.2 million. Vodafone is present in four markets (through a combination of direct ownership and strategic partnerships) with 1.2 million connections, and BlueSky is in two markets with 28,000 connections.

1.3

Financials: modest growth out to 2025

Total mobile revenues in the region grew at just 0.7% in 2018, helped by ongoing growth in data volumes as subscribers move to smartphones and higher speed networks. Growth is forecast to accelerate modestly over the coming years, with revenue growth at a CAGR of 1% out to 2025. This is lower than growth for the industry at a global level, even though the region has relatively low levels of subscriber penetration. Incremental subscribers will increasingly be from lower income and more remote population segments, which will likely dilute overall ARPU levels.

Constraints around smartphone affordability and a lack of interest in data services in certain market segments may act as a cap on growth in the medium term, indicating the issues that operators and other ecosystem players will need to address if the revenue outlook is to improve. Developing and scaling new mobile services and digital apps could also provide an additional revenue opportunity for operators.

Figure 5

Source: GSMA Intelligence

Mobile revenues in the Pacific Islands

\$ million

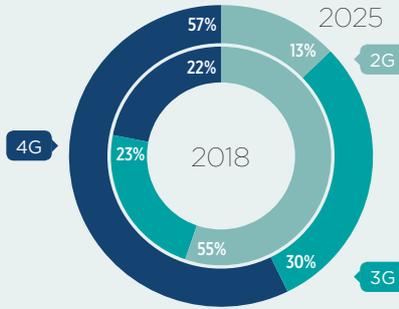


Six key mobile markets in the Pacific Islands

Papua New Guinea



TECHNOLOGY MIX*



SUBSCRIBER PENETRATION



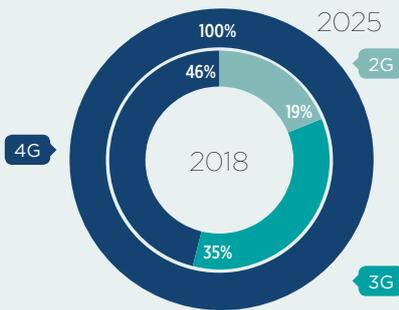
SMARTPHONE ADOPTION



Fiji



TECHNOLOGY MIX*



SUBSCRIBER PENETRATION



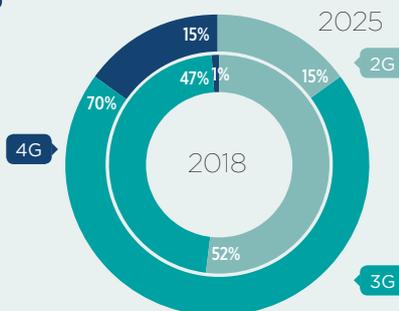
SMARTPHONE ADOPTION



Solomon Islands



TECHNOLOGY MIX*



SUBSCRIBER PENETRATION



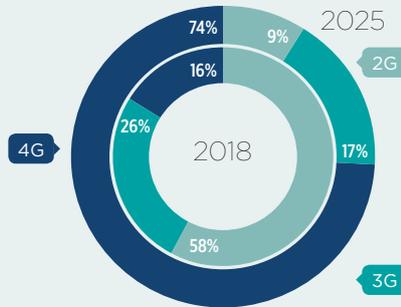
SMARTPHONE ADOPTION



New Caledonia



TECHNOLOGY MIX*



SUBSCRIBER PENETRATION



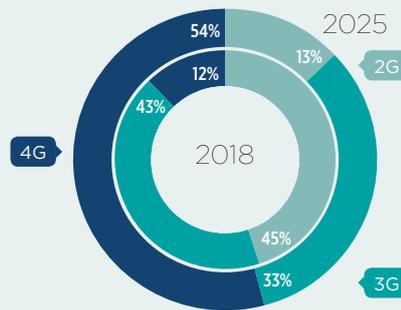
SMARTPHONE ADOPTION



French Polynesia



TECHNOLOGY MIX*



SUBSCRIBER PENETRATION



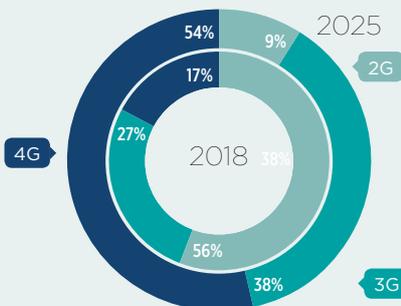
SMARTPHONE ADOPTION



Vanuatu



TECHNOLOGY MIX*



SUBSCRIBER PENETRATION



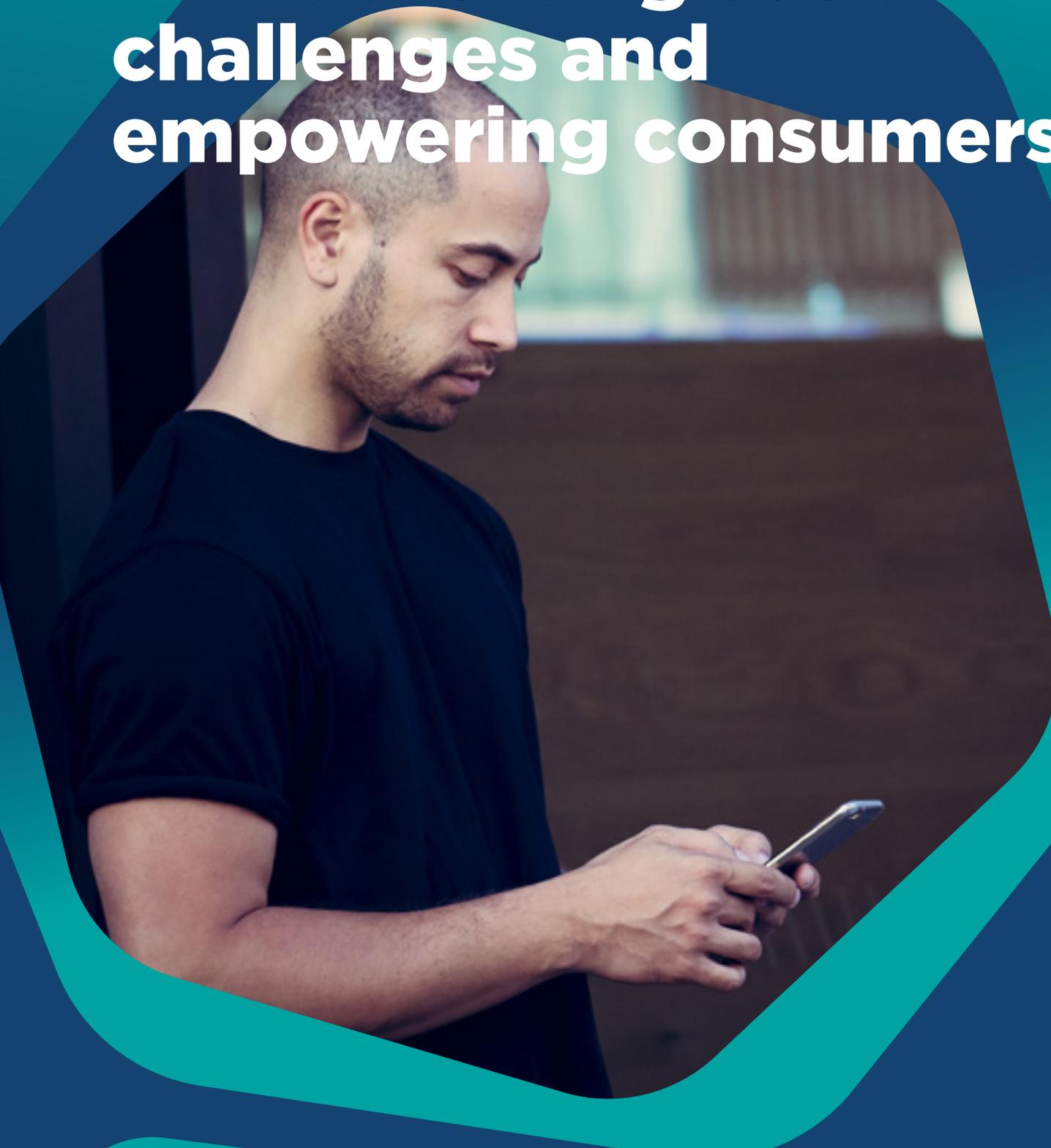
SMARTPHONE ADOPTION



* Percentage of total connections



02 Mobile as a platform for addressing social challenges and empowering consumers



2.1 Enabling life-enhancing digital services

For many individuals across the region, the mobile phone is not just a communication device but also the primary channel to get online and a vital tool to access a range of life-enhancing services. This is particularly true in rural or remote areas, where around half the population live and the provision of many services by conventional means is constrained by significant gaps in funding, skills and infrastructure.

Mobile technology is already playing a role in addressing a range of social and economic challenges across the region. These challenges are further compounded by rapid population growth, with the potential for high youth unemployment in the future, food shortages and lack of access to basic energy and utilities. For example, the United Nations estimates that some developing countries in the Pacific will need to almost double food production by 2050 to feed their growing populations.



Tupaia improving local health systems

Tupaia has mapped every health facility across six countries in the Pacific region with a free data collection app (Tupaia MediTrak). It uses APIs to sync live data from three different health database sources including those used for stock management (mSupply) and disease information (DHIS2). Tupaia is currently live in six countries – Kiribati, Solomon Islands, Vanuatu, Tonga, Cook Islands and Tokelau, and is due to be rolled out in Papua New Guinea. Tupaia is funded by an Australian government programme, the innovationXchange.

Tupaia is designed to strengthen health systems by increasing the availability of usable data to health workers and senior staff. The data that people see is customised for their role – a health supply chain manager might use Tupaia to spot bottlenecks causing poor medicines availability in specific geographies; a cold chain manager might map every broken fridge in the country; a family planning donor might use maps of contraception and service provision to plan their country programme of work.



PacFarmer improving information flows to farmers

The PacFarmer App is a mobile-based digital platform for farmers in Fiji. It allows farmers in the country to access information on government support schemes, commodity prices and weather information, as well as other features, such as market linkages with potential buyers, digital payments, credit opportunities and other financial services.

The development of the app was supported by the Australian Department of Foreign Affairs and Trade. From its initial trial focus in Fiji, the goal is to roll out the app to other countries in the region.

2.2 Mobile internet delivering digital inclusion

Mobile phones are bringing internet access to previously unconnected populations across the world, particularly in developing regions such as the Pacific Islands where there is a lack of alternative access technologies. On average, fixed broadband penetration across the Pacific Islands stands at less than 1% of the population. Where fixed connections do exist, they are often prohibitively expensive.

Countries across the Pacific Islands still face significant challenges around funding infrastructure to provide mobile and internet access to their populations, which in turn reduces the ability of governments and policy-makers to address social and economic challenges. Providing mobile coverage is a particular challenge in a region often described as ‘sea locked’, with large segments of the population living in remote and often inaccessible areas. With limited fixed line connectivity in the

region, mobile technology (complemented by satellite) is the only realistic solution to connect the unconnected populations in the region.

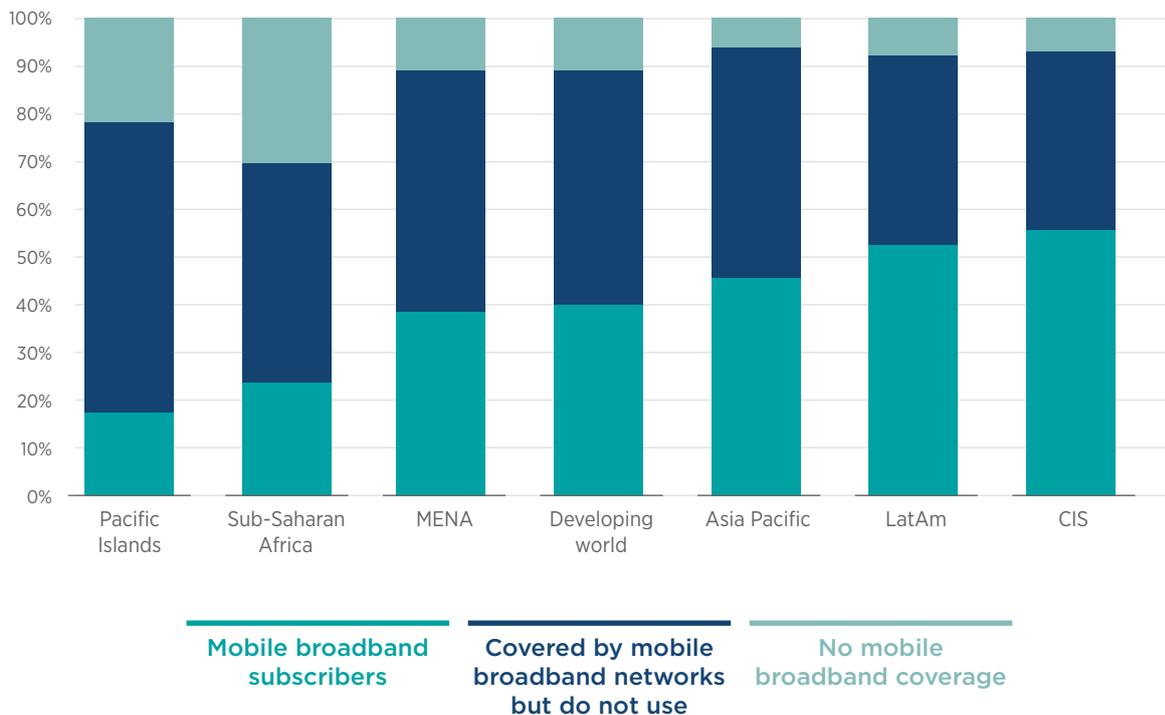
At the end of 2018, mobile internet penetration in the Pacific Islands was the lowest of any region in the world. At just 18%, it was less than half the level of the developing world average and around 3 percentage points below the average of the world’s least developed countries. This figure will grow over the coming years but by 2025 will still be only a third of the population. This will leave more than 9 million people across the region offline, limiting their ability to participate in the digital economy and take advantage of the opportunities it can offer them. Although mobile is already playing an important role in closing the access and usage gaps for key services, much remains to be done.

Figure 6

Source: GSMA Intelligence

Pacific Islands coverage gap in context

Percentage of population



Satellite plays a role in providing connectivity in the region, especially given its challenging topography. For example, satellite broadband (such as VSAT – very small aperture terminal – deployments) has been used as a way to offer connectivity to rural and remote populations in several parts of the region, as well as providing backhaul for mobile services. A recent GSMA report on mobile backhaul showed satellite services provided 1.9% of mobile backhaul across South and Southeast Asia in 2017, with a forecast that it would drop to 1.4% by 2025.² Challenges around cost and bandwidth mean that satellite will generally remain a complement to – rather than substitute for – mobile in terms of providing internet access.

Mobile Connectivity Index and the Pacific Islands: highlighting the key challenges

The GSMA Mobile Connectivity Index³ measures digital inclusion in 163 countries across the world, including six countries in the Pacific Islands. The index is built around four key enablers of mobile internet connectivity, critical to creating the right conditions of supply and demand for mobile internet connectivity to flourish:

- **infrastructure:** the availability of high-performance mobile internet network coverage
- **affordability:** the availability of mobile services and devices at price points that reflect the level of income across a national population
- **consumer readiness:** citizens with the awareness and skills needed to value and use the internet and a cultural environment that promotes gender equality
- **content:** the availability of online content and services that are accessible and relevant to the local population.

The Pacific Islands region is home to countries that sit in some of the lower of the five clusters of the Connectivity Index: both Papua New Guinea and the Solomon Islands are classified as emerging (countries with a score over 35), while the other four countries are all transitioning (scores over 50). None of these countries in the region fall into the lowest cluster, namely discoverers.

A key positive is that all the six countries have seen significant improvement in their scores over the last three years, with an average improvement in the index score for the region of 10 points. This has been primarily driven by growth in the infrastructure score, reflecting the progress in mobile broadband network deployments across the region.

2. [Mobile backhaul options](#). GSMA, 2018

3. <https://www.mobileconnectivityindex.com/>

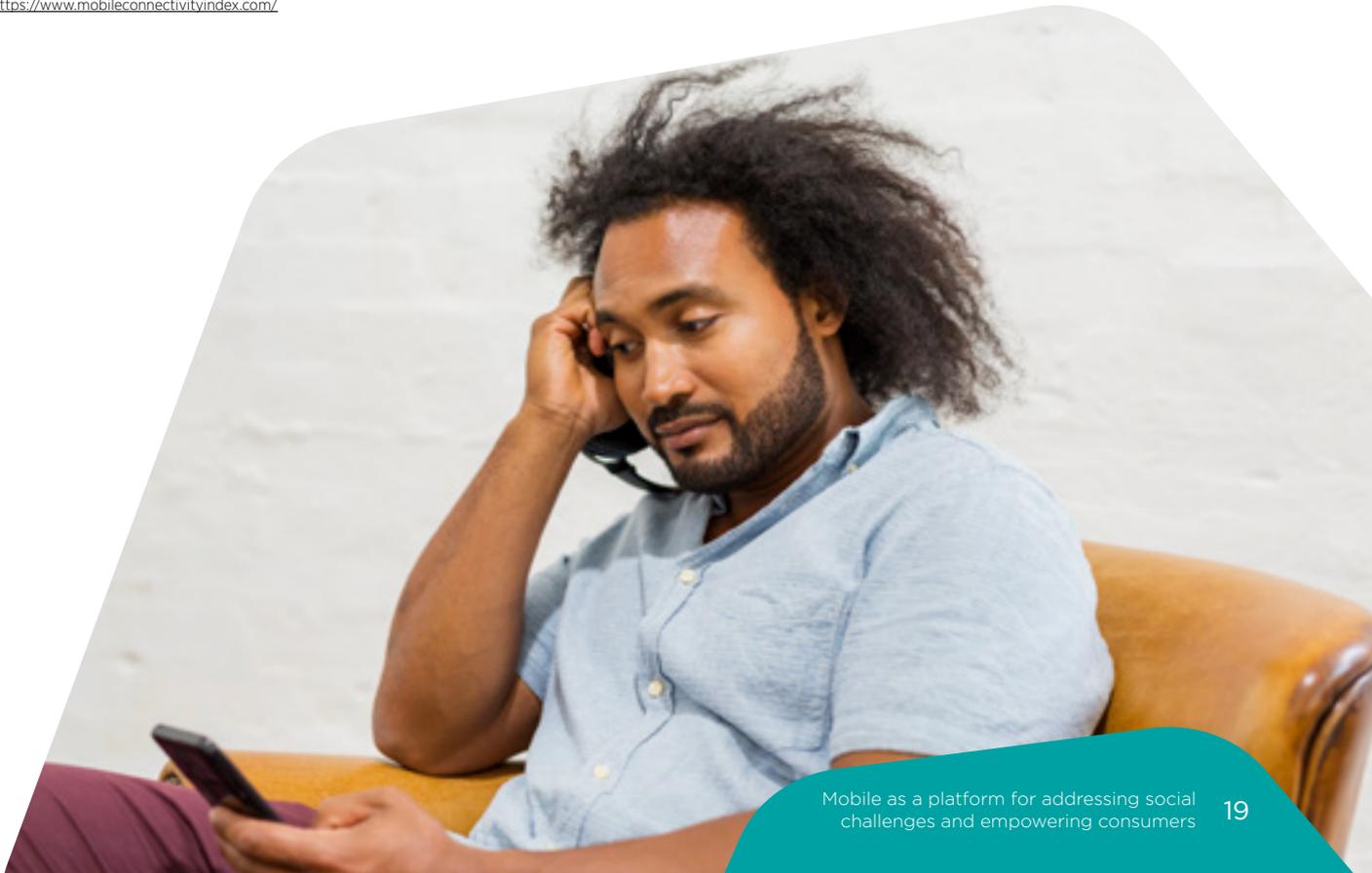


Table 1

Source: GSMA Intelligence

Factors behind the connectivity gap



| | Mobile Connectivity index | Infrastructure | Affordability | Consumer readiness | Content | Mobile internet penetration | Unconnected populations (000s) |
|-------------------------|---------------------------|----------------|---------------|--------------------|---------|-----------------------------|--------------------------------|
| Fiji | 60.1 | 59.7 | 66.6 | 78.3 | 42.0 | 60% | 366 |
| Papua New Guinea | 46.0 | 27.4 | 62.4 | 51.3 | 51.2 | 12% | 7,482 |
| Samoa | 63.8 | 62.4 | 58.8 | 75.3 | 59.9 | 22% | 155 |
| Solomon Islands | 45.9 | 33.6 | 56.3 | 63.7 | 36.9 | 21% | 497 |
| Tonga | 57.8 | 44.1 | 66.5 | 80.8 | 47.0 | 17% | 90 |
| Vanuatu | 55.4 | 47.5 | 60.1 | 62.8 | 52.5 | 22% | 221 |

Many countries in the region face issues around infrastructure – a key factor behind the connectivity gap. Several countries are yet to complete the digital switchover process, including Papua New Guinea, Tonga and Solomon Islands. They are therefore yet to allocate spectrum in the digital dividend band (700 MHz) to mobile services. This band is key to bringing affordable 4G mobile broadband services from urban centres to rural villages. These countries, as well as many others across the region, are now at a disadvantage when it comes to supporting rapidly growing mobile broadband uptake and usage, as well as advanced 4G – and in future 5G – services.

Other supporting infrastructure includes the availability of international internet bandwidth and access to electricity. New submarine cables have been built over recent years and others are under construction. For example, in 2018, Fiji was connected to the Tui-Samoa undersea cable, which in turn connects to the major South Cross cable that provides direct links to the US and New Zealand. This improved connectivity and has allowed the rollout of free Wi-Fi hotspots on all Fiji National University campuses as well as in public parks across the country.

The economic case for investing in new undersea cables in the region is challenging, with international aid often playing an important role in funding a number of schemes. For example, the Australian Department of Foreign Aid and Trade is funding the new Coral Sea Cable system, which will connect Australia to Papua New Guinea and the Solomon Islands, including a domestic network connecting Honiara with Auki, Taro and Noro. A number of existing cables are due to be replaced over the next five to ten years, providing the opportunity to connect more islands in the region. The growth in submarine capacity across the region, combined with growing demand as users migrate to smartphones and more data-intensive devices, is already bringing down the cost of international IP capacity.

Access to electricity remains a challenge in many islands and archipelagos; for example, only 17% of rural dwellers in Vanuatu have access to any form of power other than battery-powered mobile lamps or radios.⁴

4. Working Group on Broadband for the most vulnerable countries, Broadband Commission for Sustainable Development, July 2018



Powering the digital ecosystem in Papua New Guinea

One of the chief enablers of a digital ecosystem is reliable, affordable electricity. This includes powering mobile towers that tend to rely on expensive fuel or solar and require high capital expenditure. It also includes enabling mobile phone subscribers to recharge their phone locally and conveniently without having to travel to a village shop and pay for a phone charge (the average phone user pays between \$7 and \$14 per month to charge their phone, with each charge costing between \$1.00 and \$3.50).⁵

Less than 15% of the Papua New Guinea population are connected to the grid. Meanwhile, those who have electricity pay high prices while contending with frequent blackouts, even in urban centres. Beyond centralised electricity, PPL operates 19 provincial mini-grids and there are about 100 small rural mini-grids operating at the district level run by local governments. Nearly all these mini-grids run on diesel, although some have hydro and solar power. Through the Department of Petroleum and Energy, the government is working on a new national energy policy that will reportedly use more renewable energy. Under the national plan, the government's goal is 70% connectivity to the grid by 2030 and 100% by 2050, in line with its Vision 2050.

Affordability is generally less of an issue, with all six countries returning relatively similar scores. However, a common challenge across all countries under the affordability measure is the cost of mobile services. The ITU's Broadband Commission established a target to bring the price of internet access below 5% of average income per capita by 2015,⁶ a figure that at least one of the countries in the region has yet to achieve, while Papua New Guinea is only just below this target. The comparable figure for the Asia Pacific region as a whole in 2017 was 1.8%. Low income levels are a major component of the affordability challenge, but there are other components that operators and regulators can look to address. These include developing more cost-effective solutions to providing coverage in remote areas, as well as policy issues such as sector tax rates.

Consumer readiness scores are relatively high in five of the countries, with the exception of Papua New Guinea. This reflects in large part government efforts in the region to address digital literacy and skills. For example in Vanuatu, The Computer Lab and Internet Community Centre (CLICC) is an

initiative of the universal service fund for school connectivity. An initial 19 schools were selected for CLICC with a key criteria being the availability of electricity. Other factors included capacity for local support and the potential impact on teachers, students and members of the community.

In Fiji, the Vodafone ATH Foundation and its 'Mobile for Good' programme works with a number of partners to address social mobility in areas such as health and education. A recent initiative offers devices and free Wi-Fi connectivity to schools and students in certain parts of the country.

The availability of online **content** and services that are accessible and relevant to the local population is also an important factor in addressing the digital divide, and one where a number of countries score relatively poorly. Linguistic diversity is a challenge; for example, with 852 known languages, Papua New Guinea is the most linguistically diverse country on the planet. Limited development of e-government solutions and low social media penetration (in large part a factor of the diverse linguistic backdrop in the region) limit the availability of relevant content.

5. IFC, 2014, pg.10

6. <https://www.broadbandcommission.org/Pages/default.aspx>

2.3 Enabling innovation for socioeconomic impact

Tech hubs are a critical part of the start-up ecosystem in any region, helping the development of home-grown digital content and services. Tech hubs promote ideas and collaboration locally, and provide start-ups with business support resources and services to help them scale. The GSMA Ecosystem Accelerator programme,⁷ which aims to build synergies between start-ups and mobile operators, found there are currently six hubs operating in four countries across the Pacific Islands region. For example, in Papua New Guinea, Kumul Game Changers helps innovative entrepreneurs scale their operations through a 6-to-12-month support programme. Additionally, The PNG National Development Bank announced in late 2017 a new incubator in Port Moresby.

In Fiji, an initiative launched in 2018 by the government to empower young entrepreneurs through the Youth Entrepreneurship Scheme should see the ecosystem grow. Further, the establishment of Technology Institutes in countries such as Kiribati and Timor-Leste are positive evidence of a collective effort towards innovation and entrepreneurship support in the region.

However, most islands still lack properly developed innovation ecosystems due to the highly fragmented nature of the region: the limited size of the individual markets, the complexity of developing sound infrastructure between the archipelagos, and the significant leverage of larger Asia Pacific regional hubs such as Sydney and Wellington. This highlights the need for external agencies and partners to play a role in fostering innovation in the region.

The GSMA Ecosystem Accelerator Innovation Fund⁸ supports start-ups willing to work with mobile operators, is sector-agnostic and open to post-revenue start-ups using mobile to solve local challenges in the Pacific Islands. The fund recently announced funding for 11 new start-ups across the developing world, of which two were in the Pacific Islands. The Ecosystem Accelerator programme helps start-ups with grant funding, technical assistance, and the opportunity to partner with mobile operators in their markets to help scale products and services into sustainable businesses. The GSMA also plans to run several entrepreneurship events in the region in 2019, in the form of bootcamp/pitching competitions for start-ups aiming to build the capacity and visibility of local ecosystems.



Pacific Ads Group matching professionals with customers

Pacific Ads Group offers several online classifieds across the Pacific, mainly for properties and cars. In a country where most of the population is employed in the informal economy, there are limited formal marketing channels beyond word of mouth. Users of such platforms often report difficulties finding local professionals to help with home projects or maintenance. Pacific Ads Group is launching a new digital service to match local professionals with potential local customers.

Pacific Ads Group received a grant from the GSMA Ecosystem Accelerator Innovation Fund in November 2018 to develop a matching platform for local service providers and potential local customers, and to expand the service to five cities across Papua New Guinea. The platform is expected to allow service providers to better market themselves as trusted businesses, and later to gain access to financial services, such as credit to expand their business and increase their income.

7. The Ecosystem Accelerator programme is supported by the UK Department for International Development (DFID), the Australian Government, the GSMA and its members

8. [GSMA Ecosystem Accelerator Innovation Fund: Start-up Portfolio](#), GSMA, 2018



SyeEye harnessing mobile to solve logistics

Samoa, like most other small Pacific Islands, has challenging logistical infrastructure due to the lack of a national address system. This makes it difficult for small businesses to market themselves and to use e-commerce to grow their business. SkyEye develops services that harness mobile and geospatial technologies to solve logistical challenges in Pacific Island countries.

SkyEye received a grant from the GSMA Ecosystem Accelerator Innovation Fund in November 2018. SkyEye aims to develop a platform for taxis and delivery drivers to receive orders in real time. In the absence of an effective address system, the platform leverages SkyEye's GIS expertise to locate pick-up and drop-off points. The platform is expected to create opportunities for small businesses and e-commerce players to deliver their goods and to unlock new income for drivers

Growing interest in blockchain in the developing world

Blockchain is among a range of emerging technologies seeing growing interest and investment from companies and innovators. Technologies such as blockchain (as well as others such as artificial intelligence) have the potential to address a range of social and economic issues in the developing world. Mobile operators are actively involved in trials in many regions.

A recent report by the GSMA identified several use cases where blockchain technologies could potentially provide solutions.⁹ These included sovereign identity (to help individuals manage their legal identity); ensuring transparency around international aid payments (particularly distributing and tracking funds to ensure maximum impact);

and humanitarian payments (to distribute funds to refugees and other populations in need). Early-stage trials and deployments are ongoing in a number of countries around the developing world, with a clear opportunity for operators with their unique assets and capabilities to capitalise on and develop these use cases further.

There are a number of active deployments and trials in the broader Asia Pacific region, while interest is now growing in several countries in the Pacific Islands. For example, in Papua New Guinea there is a bill before Parliament for the declaration of a blockchain-focused Special Economic Zone in Finschhafen. Over the course of 2018, there were two blockchain-focused conferences in the region, highlighting growing interest.¹⁰



TraSeable supporting seafood sustainability

TraSeable Solutions is a Fijian tech start-up that supports global seafood sustainability through a blockchain-ready software-as-a-service (SaaS) platform for traceability in an industry that to date has relied almost exclusively on physical paperwork. The start-up aims to foster collaboration between stakeholders, leverage and integrate Internet of Things (IoT) technology, and facilitate transparency by providing regulators with the means of verifying and validating end-to-end, forward and backward traceability of seafood products.

9. [Blockchain for Development: Emerging Opportunities for Mobile, Identity and Aid](#), GSMA, 2017

10. "Blockchain in the Pacific", ICDP, October 2018

2.4 Mobile helping boost financial inclusion

Financial inclusion remains a challenge across all countries and islands of the region, though a range of initiatives at a regional and country level have made some progress in recent years. The Pacific Financial Inclusion Programme (PFIP) was launched in 2008 by the United Nations Development Programme (UNDP) and the UN Capital Development Fund (UNCDF). It has funded 44 projects with financial service providers who have innovated with technology and products, in the process helping more than 2 million Pacific Islanders access formal financial services.

In the Solomon Islands, mobile banking has become part of everyday life for a growing portion of the local population. According to the PFIP, many Solomon Islanders previously relied on expensive, time-consuming journeys by boat to reach the relatively small number of physical bank branches scattered across the archipelago. Today, close to 200,000 accounts across the country are linked to digital banking platforms. Further efforts are underway to address the challenge that more than half the population still lack access to formal financial services.¹¹



EziBank helping reduce Samoa's unbanked

With only 39% of the population in Samoa having any form of access to financial services, the recently launched EziBank product could be key to reducing Samoa's unbanked population. EziBank combines NBS basic banking services with other payment services available through Digicel Mobile Money. Funded through a grant from the United Nations Pacific Financial Inclusion Programme, the product allows customers to check their bank account balance, receive remittances straight into their bank account, and make deposits and withdrawals between their Digicel and NBS accounts. This can be done on all types of mobile phone using a USSD menu.

Mobile has a key role to play in facilitating the adoption of financial services in many developing regions. Today there are a total of nine live mobile money services available to the unbanked in six different countries across the Pacific region: two in Fiji, three in Papua New Guinea and one in each of Samoa, the Solomon Islands, Tonga and Vanuatu. There are high levels of registration on some islands: 51% of the combined adult population of Fiji, Samoa, Solomon Islands and Tonga have a mobile money account. However, activity levels remain low, with less than 10% of these accounts currently active.

Operating and scaling mobile money services in the Pacific Islands is relatively challenging, and adoption rates in many countries have stalled. A particular challenge is to expand the range of services used beyond cashless person-to-person (P2P) transactions by exchanging airtime. As well as

geographic challenges, issues include low financial literacy, low population densities and the diverse range of local languages.

Fiji was one of the first countries to launch mobile money services in 2010, with services offered by both the main players, Vodafone and Digicel. The adoption of new services has been aided by the government's moves to make Fiji a cashless society, with for example the introduction of its e-Transport initiative that removes all cash payments from the country's public bus network. Vodafone has been supporting this initiative through the introduction of self-service kiosks to top up the e-transport cards. Other features include the ability to top up cards remotely using the company's M-PAISA mobile wallet.

11. <http://www.pfip.org/>

PFIP in collaboration with Vodafone has set up a mobile financial services Innovation Lab project to design, test and validate relevant financial products and delivery models, with the goal of enabling low-income Fijians to effectively use them through the Vodafone M-PAISA mobile wallet. The Lab will focus on creating financial solutions for priority segments, especially women.

Other markets have encountered problems scaling mobile money services. For example, Digicel in Papua New Guinea launched its service Cellmoni in 2011, but has not been able to scale. There are though some more recent signs of encouragement in terms of the uptake of these and similar services. Data on the 2018 implementation of Papua New Guinea's second National Financial Inclusion Strategy shows a 55% increase in users with mobile financial services (MFS) accounts and a 62% increase in women with MFS accounts.

National and local financial institutions with a presence in Papua New Guinea such as BSP, Westpac, ANZ and microbank MiBank are leveraging the networks of Digicel and bmobile-Vodafone to expand banking services to rural areas. Customers

can use their mobile phone or new debit card to access funds they have deposited, transfer money, or check their balance without having to travel to a bank.

As of August 2018, Digicel was processing more than 1 million transactions per month, primarily through its bank partners. However, the operator is looking to leverage its extensive distribution network to reach the last mile and expand rural financial inclusion. Digicel has plans to relaunch its mobile money service, leveraging its agents selling airtime top-ups as mobile money agents. As part of the SIM registration process, Digicel customers are given the option to sign up for a mobile wallet.

Digicel is also investigating new use cases to support the growth of the mobile money ecosystem. For example, the potential of mobile money is high to digitise payments in the health and agriculture value chains to improve efficiencies; or to further support access to clean energy in Papua New Guinea by enabling the solar pay-as-you-go model,¹² providing affordable and reliable access to clean energy for off-grid populations.

12. IFC, August 2018



03 Harnessing spectrum and regional collaboration



3.1

The importance of spectrum and WRC-19

Successfully expanding connectivity and nurturing innovation in the Pacific Islands region is dependent on several factors. To unlock the full potential of existing and future mobile networks, access to sufficient spectrum for better coverage and capacity is a necessity. When licensing spectrum, the priority for governments and regulators should be to support affordable, high-quality mobile services. Addressing these issues requires collaboration between the mobile ecosystem, local industries and governments.

One of the best opportunities for this collaboration is the World Radiocommunication Conference (WRC) of the ITU. The conference takes place every three or four years. With the participation of administrations from around the world, agreements are reached at the WRC on changes to international spectrum allocations, and associated regulatory provisions, with a major focus on making additional bands available for potential mobile broadband use, referred to as IMT.

The spectrum harmonisation achieved through the decisions at these WRCs has enabled huge economies of scale, leading to the development of low-cost devices and unprecedented use of mobile worldwide. For example, WRC-15 identified spectrum for IMT in a number of bands (600 MHz, 1500 MHz and 3.5 GHz) which can now be planned for 5G services. 5G needs spectrum in these lower bands for coverage but also in mmWave bands to meet the demand for very high capacity.

At WRC-19, the future success of 5G is at stake, since the decision for mmWave bands will be taken at this conference. This is not just for countries where 5G is rolling out in the next couple of years, but for everyone. The spectrum assignment process is a long-term effort. Spectrum identified at WRC-19 can be used for decades to come: it is important to shape 5G today.

The 5G work at WRC-19, centred around Agenda Item 1.13 (AI 1.13), looks at IMT spectrum in frequencies between 24.25 and 86 GHz. Bands such as 26 GHz and the 40 GHz ranges already have strong multiregional support, while other bands also have significant traction, such as 66-71 GHz. Global harmonisation is possible in these three bands.

Supporting an IMT identification during WRC-19 offers regulators the flexibility to make mmWave spectrum available for mobile services, if and when needed. This additional flexibility comes with no downsides. Regulators choose the right time to assign widely harmonised bands and benefit from international trends as their national 5G market develops.

The GSMA recently published a report¹³ on the socio-economic benefits of 5G services provided in mmWave bands. Rolling out 5G using millimetre waves is an opportunity to radically reshape services such as ultra-high speed broadband, industrial automation and intelligent transport systems. It can help provide access to better healthcare, make virtual and augmented services mainstream, and improve public safety.

The Pacific Islands region might not be one of the first to roll out 5G services but it can benefit from a mature ecosystem and global economies of scale to see 5G develop in the same way as LTE has done in the region. New submarine cables with improved capacity and other technical advancements are setting the stage for advanced broadband services, including 5G.

13. [Study on Socio-Economic Benefits of 5G Services Provided in mmWave Bands](#), GSMA, 2018

The report also highlights the impact that a mature ecosystem has on technology adoption. The annual growth of mmWave 5G will be much faster in developing regions once launched, closing the gap between the early adopters and countries where networks are launched at a later stage. Supporting an IMT identification in the next WRC offers regulators the flexibility to make a portion of the mmWave spectrum available for mobile services, but only when the need is justified rather than confined by the existing allocations.

In the meantime, assigning existing IMT spectrum to mobile operators in a timely and affordable manner is key to boost mobile adoption. Previous World Bank studies found a 10% increase in mobile would add 1.3% GDP of the country on average. Improving connectivity and decreasing the digital divide need to be at the centre of digital policy for the region.

What are the GSMA's key WRC-19 positions?

A successful identification of spectrum for IMT under Agenda Item 1.13 is vital to realise the full potential of 5G networks

The GSMA supports the 26 GHz, 40 GHz and 66-71 GHz bands.

Due to the large amount of spectrum needed for 5G services, the 45.5-52.6 GHz range also needs to be considered

Technical studies show coexistence between IMT and other services is possible

3.2

The importance of collaboration and harmonising regulation

A number of organisations, including the World Bank and the GSMA, are highlighting the importance of collaboration and regulatory harmonisation across regions if the potential of both mobile technology and indeed the broader ICT sector is to be realised.

There are a growing number of examples of cross-border collaboration and harmonisation emerging. For example, the Common Market for Eastern and Southern Africa (COMESA) is active as a supra-national competition authority in merger-control cases and is expanding its remit. However, it is unclear at this stage if COMESA will realise its original goal of creating a centralised telecoms regulatory body.¹⁴ On a similar basis, in the Channel Islands the competition regulators in Jersey and Guernsey created a joint body, the Channel Islands Competition and Regulatory Authorities (CICRA), to regulate both competition law and economic regulation.

The GSMA has also published a report calling for deeper collaboration and cross learning by government and privacy enforcement authorities in the Asia Pacific region in the specific area of cross-

border data flows.¹⁵ The report highlights both the importance of international data flows to driving economic growth, but also the challenge that a patchwork of geographically bound privacy laws can restrict how Asian companies innovate and bring better products and services to consumers in the future.

The lack of scale in a highly fragmented region is a key challenge for development of the mobile and broader digital economy in the Pacific Islands. However, the region is not alone in facing this challenge; a number of countries in Africa are facing issues around challenging topography and a lack of scale. Representatives from the Ministries of Telecommunications/Information and Communications Technology (ICT) of Member States of the Economic Community of West African States (ECOWAS) region called in 2018 for increased cooperation among National Regulatory Authorities for the effective regulation of the ICT market.¹⁶ The publication of regional guidelines aims to allow the harmonisation of policies and provide clarity for operators on the conditions in any market they choose to enter.

14. "Competition Policy in the Digital Age Case Studies from Asia and Sub-Saharan Africa", GSMA, December 2016

15. "GSMA: free flow of data across borders essential for Asia's digital economies", GSMA, September 2018

16. "ECOWAS seeks to harmonise Telecommunications/ICT market regulations in the region", ECOWAS, September 2018



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