

WORLD BANK GROUP

PAPUA NEW GUINEA ECONOMIC UPDATE JULY 2020

In the Time of COVID-19: From Relief to Recovery



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July 2020



Preface and Acknowledgments

This publication is the fifth in the current series of Papua New Guinea Economic Updates (*PNG EU*). It has two principal aims. First, it analyzes the key recent developments in Papua New Guinea's economy and places these in a longer-term and global context. Based on these developments and recent policy changes, the *PNG EU* updates the outlook for the country's economy and the welfare of its citizens. Second, the *PNG EU* provides a more in-depth examination of a selected development issue and evaluates the implications of recent trends and policy reforms in terms of the government's stated development objectives. It is intended for a broad audience, including policy makers, business leaders, and the community of analysts and professionals engaged in Papua New Guinea's evolving economy.

The *PNG EU* is compiled by the Macroeconomics, Trade and Investment Global Practice, under the guidance of Michel Kerf (Country Director), Ndiame Diop (Practice Manager), and Stefano Mocchi (Country Manager). The core economic team comprises Ilyas Sarsenov, John Grinyer, and Rashad Hasanov. The special focus section on physical capital development was prepared by Fei Deng, Noroarisoa Rabefaniraka, Andrew Cooper, David Ling, Mits Motohashi, Gerard Fae, Sevesoa Maso, Stephane Dahan, Jan Overbeek, Shona Fitzgerald, Natasha Beschorner, James Neumann, Alex Sundakov, and Jordan Nelson. The team would like to acknowledge contributions provided by Ekaterine Vashakmadze, Virginia Horscroft, Aneesa Arur, Rochelle Eng, Matthew Dornan, Nathalie Pazmino, Kenia Parsons, Brian Mtonya, Wei Zhang, and Wilfred Lus. Gwen Maru, Rachel Leka, Jason Sze, and Tasha Sinai provided administrative support. Bronwen Brown edited the text. Dissemination is organized by Tom Perry, Hamish Wyatt, Ruth Moiam, and Helen Wagambie.

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Abbreviations and Acronyms

ADB	Asian Development Bank	MCIT	Ministry of Communications and Information Technology
APEC	Asia-Pacific Economic Cooperation	MMBtu	Million Metric British thermal units
BPNG	Bank of Papua New Guinea	MSMEs	Micro, small, and medium-sized enterprises
CADIP	Civil Aviation Development Investment Program	MTDP	Medium-Term Development Plan
CSO	Community service obligation	Mtpa	Million tons per annum
DDA	District Development Authority	MTTP	Medium-Term Transport Plan
DOTI	Department of Transport and Infrastructure	MW	Megawatt
DoW	Department of Works and Implementation	NAC	National Airports Corporation
DPE	Department of Petroleum and Energy	NCD	National Capital District
DSIP	District services improvement program	NEC	National Executive Council
EAP	East Asia and Pacific region	NEROP	National Electrification Rollout Plan
EMC	Electricity Management Committee	NGO	Nongovernmental organization
EMDEs	Emerging Market and Developing Economies	NICTA	National ICT Authority
FBO	Final Budget Outcome	NMSA	National Maritime Safety Authority
GDP	Gross domestic product	NRNS	National Road Network Strategy
GSMA	Global System for Mobile Communications Association	NRPB	Non-resource primary balance
ICCC	Independent Consumer and Competition Commission	NTS	National Transport Strategy
ICT	Information and communications technology	NWSHA	National Water, Sanitation and Hygiene Authority
IMF	International Monetary Fund	O&M	Operations and maintenance
IRC	Internal Revenue Commission	PGK	Papua New Guinean Kina
IPP	Independent power producer	PNG	Papua New Guinea
ITU	International Telecommunication Union	PNG EU	Papua New Guinea Economic Update
JIA	Jacksons International Airport	PNG LNG	Papua New Guinea Liquefied Natural Gas Project
JMP	UN Joint Monitoring Program	PNGPCL	PNG Ports Corporation Limited
KCH	Kumul Consolidated Holdings Limited	PPL	PNG Power Limited
KFR	Kina Facility Rate	PPP	Public-private partnership
km	kilometer	PSIP	Provincial services improvement program
KTH	Kumul Telikom Holdings	QoS	Quality of service
kWh	Kilowatt hour	RAA	Rural Airstrips Authority
LNG	Liquefied natural gas	RTA	Road Traffic Authority
		SOE	State-owned enterprise
		US\$	United States dollar
		WaSH	Water, sanitation, and hygiene

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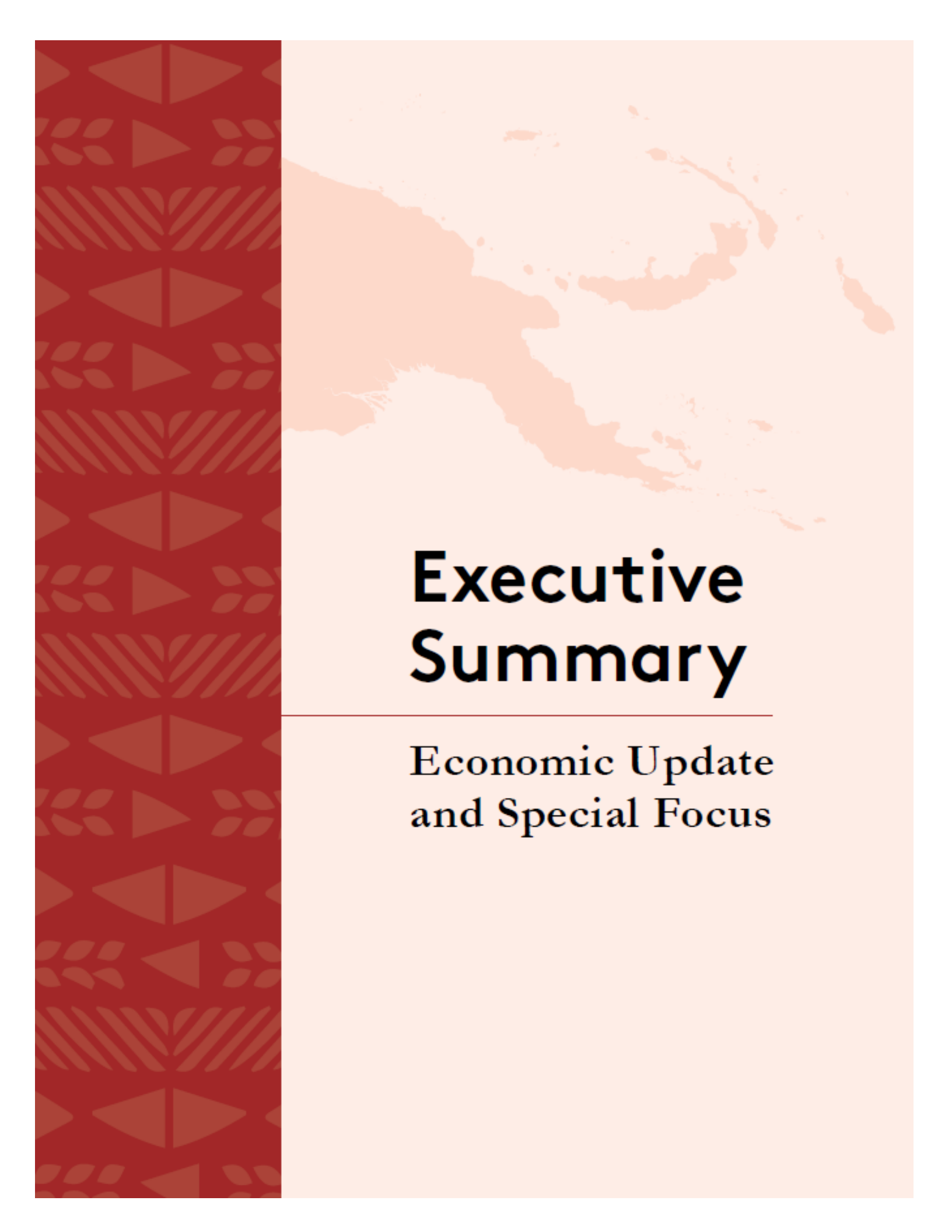
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Executive Summary

**Economic Update
and Special Focus**

A. Economic Update in the Time of COVID-19: *From Relief to Recovery*

Like most economies worldwide, Papua New Guinea was affected by the fear of COVID-19 in the first half of 2020. To prevent the spread of the disease, Papua New Guinea's authorities declared a state of emergency, beginning on March 24, 2020 and running for three months, with two extensions and some relaxation since April 24. As of late June, the spread of COVID-19 in the country was limited, with more than ten cases detected, while some additional suspected cases awaited test results. Although the authorities have contained the COVID-19 outbreak, the country will remain vulnerable to a new COVID-19 wave until a vaccine is developed and available to everyone.

Papua New Guinea's economy has been hit hard by the COVID-19 crisis due to weaker demand and less favorable terms of trade. Pandemic-related global and national movement restrictions have weakened external and domestic demand and affected commodity prices, which will lead to an economic contraction, wider financing gaps in the external and fiscal accounts, and higher unemployment and poverty than previously anticipated in 2020. Our updated projections for 2020 (Table 1) suggest that—compared to our previous forecasts in January—real GDP growth will drop by 4.2 percentage points (to -1.3 percent), the current account surplus will decline by 11 percentage points (to about 15 percent of GDP), and the fiscal deficit will widen by 0.6 percentage points (to -6.4 percent of GDP). At the same time, gold prices are at near-record highs, fuel import costs are falling, and Papua New Guinea is not highly dependent on foreign tourist income or remittances from abroad, softening the impact on the external accounts. Lower prices for liquefied natural gas (LNG) will have a limited impact on government revenues, as resource revenues remain small. Australia, a significant trading partner, has also successfully contained the virus so far, providing hope that regional economic disruption will be lower than in Europe or the Americas.

Table 1. Papua New Guinea: Key Economic Indicators, 2017–22

	2017	2018	2019	2020	2021	2022	Percentage point differences from		
							January 2020 projections		
							2020	2021	2022
		Est.	Est.	Updated projections			Δ change		
Real GDP growth (percent), <i>of which:</i>	3.5	-0.8	6.0	-1.3	3.4	3.0	-4.2	0.5	0.0
Resource economy	4.4	-5.1	10.0	-2.7	4.8	3.1	-5.2	2.1	1.3
Non-resource economy	1.6	3.1	1.9	0.0	2.3	2.7	-3.1	-1.1	-1.7
GDP deflator (percent)	7.7	7.2	3.7	-2.0	8.4	4.6	-5.8	3.0	0.7
Current account balance (percent of GDP)	23.7	24.2	22.7	15.1	15.8	11.0	-11.0	-2.1	2.6
Gross official reserves (in months of imports)	4.0	5.1	5.1	3.4	3.4	3.9	-1.0	0.1	0.1
Fiscal balance (percent of GDP)	-2.5	-2.7	-4.9	-6.4	-3.8	-2.9	-0.6	0.2	-0.3
Public debt, net (percent of GDP)	35.9	37.7	39.2	47.0	46.5	47.5	5.0	2.5	3.8

Sources: Official data; World Bank staff estimates and projections.

The authorities reacted swiftly to the emerging external shock by developing a package of emergency health and economic relief measures. In early April 2020, the government mobilized its resources and appealed to development partners and the private sector for additional support to protect the lives and livelihoods of vulnerable households and businesses. The ensuing package of health and economic support measures totaled roughly PGK 1,835 million (about US\$530 million or 2.2 percent of GDP) in 2020. Reflecting the government's limited fiscal space and anticipated revenue shortfalls, the health and economic support package will be financed by external concessional loans (PGK 670 million), foreign grants (PGK 65 million), and the use of employees' savings in superannuation funds in job-loss cases (PGK 500 million). Commercial banks agreed to provide loan repayment holidays to affected households and businesses for three months (a package estimated at PGK 600 million). The tax authority provided deferrals for tax filing and payment for two months and prioritized processing of goods and services tax refunds for medical supplies. The central bank injected additional liquidity into the system and provided foreign currency for COVID-19-related purchases of medicine and medical equipment.

While the focus of the authorities is currently on crisis mitigation measures, they should also look beyond the current year at a more robust and resilient recovery over the medium term. Real GDP growth is expected to rebound from a contraction of 1.3 percent in 2020 to an expansion of more than 3 percent in 2021. Economic growth in the medium term will be supported by foreign investment in new resource projects, including the Papua LNG (liquefied natural gas) project, the Wafi-Golpu gold and copper mine, the P'nyang gas field, and the Pasca A gas condensate field. Potential expansions of the existing Porgera gold and silver mine (subject to its license extension) and the Ramu NiCo (nickel and cobalt) mine would also contribute to the impending investment boom. However, considering that the economy entered the COVID-19 crisis with a poor record of resilience to external shocks, it will be vital to set the stage for more sustainable and inclusive development by strengthening macroeconomic management and accelerating structural reforms while protecting the vulnerable. A set of proposed policy options for the authorities to consider for preparing the economy for resilient recovery is presented below (Table 2).

Table 2. Proposed Policy Options to Prepare the Economy for Resilient Recovery

	Short Term Immediate Crisis Response (being implemented)	Medium Term Resilient Economic Recovery (to be considered)
Protecting lives and the health of the population		
Health of the nation	Implementing the COVID-19 Emergency Preparedness and Response Plan, without undermining funding for general frontline health service delivery	Prioritize full and timely disbursement of budgeted funds for frontline health service delivery
Supporting livelihoods of vulnerable households and small businesses		
Social protection	Providing unemployment packages and in-kind support to newly poor and vulnerable	Introduce a targeted social assistance program
Business support and job protection	Providing tax relief and financial support to micro, small, and medium-sized enterprises	Enhance community-based financial institutions; leverage mobile and digital payments technology
Ensuring stable and sustainable development		
Prudent fiscal policy	Working on an economic stimulus package	Implement counter-cyclical fiscal policy
Public debt sustainability	Relying on friendly concessional financing	Strengthen debt management capacity
Physical infrastructure development	Cutting non-essential capital spending	Resume the Connect PNG program

Quality physical infrastructure investment will be a crucial area for the recovery and resilience phase. In late 2019 the government introduced a new program, Connect PNG, to improve the country's road, port, and telecommunication connectivity. However, the government's pre-COVID-19 infrastructure investment plans must be amended amid the current crisis. A COVID-19-related revenue shortfall and increased spending for the health emergency and economic support package have created an unanticipated fiscal gap of over US\$400 million (1.8 percent of GDP) in 2020. The government will have to trim non-essential spending, and the capital budget is expected to be hit harder than the recurrent budget. The government may need to resume the Connect PNG program once the pandemic is over while keeping the overall fiscal framework under control. The special focus section of this report investigates constraints and opportunities for physical infrastructure development in Papua New Guinea.

B. Special Focus: *Investing in Physical Infrastructure for Sustainable Development*

Providing equitable access to quality infrastructure is one of the most important ways a country can reduce poverty and enhance sustainable growth. Access to energy allows industrial and commercial activities to flourish and contributes to livelihood improvement; access to roads allows people to reach schools, markets, and jobs; access to safe water and sanitation helps limit the incidence of waterborne diseases and improve public health; and access to information and communications technology (ICT) connects people with information and with each other, and opens their horizons to the wider world. By building and maintaining appropriate infrastructure, Papua New Guinea can work toward better living standards for its citizens and toward greater, more sustainable economic growth.

Electricity access in Papua New Guinea remains among the lowest in the world. The country has an abundance of natural energy resources—hydropower, natural gas, and solar—but they are underutilized: less than 250 Megawatt (MW) of its hydropower potential of 15,000 MW is harnessed, and the country exports liquefied natural gas but imports petroleum products to generate electricity. Only about 13 percent of the population has access to on-grid electricity and about 25 percent to off-grid electricity. Even among those who have access, the cost of service delivery is high, and the supply of power is unreliable.

Papua New Guinea’s transportation infrastructure network consists of roads, airports, ports and waterways infrastructure, but network efficiency and safety are a challenge. The road network comprises 8,738 kilometers (km) of national roads in 12 separate networks (not interconnected), and roughly 21,000 km of subnational roads, mostly unsealed. About 35 percent of the population lives more than 10 km from a national road, and 17 percent have no access to roads at all, making aviation and maritime shipping crucial transport modes. While the airport at the capital, Port Moresby, has been upgraded, the condition of the country’s other airports has deteriorated over time. Communities without access to road and air travel rely on riverine and littoral maritime transport, but maritime and waterways infrastructure is mostly rudimentary and is dangerous for both passengers and cargo to use.

In recent years, there has been a gradual increase in the number of households with improved water supply, but overall access is still among the lowest in the world. As of 2017, 41 percent of Papua New Guinea’s population had access to safe drinking water—35 percent of the population in rural areas, and 86 percent in urban areas—but rural access to sanitation stood at 8 percent and urban access at 48 percent. Limited access to improved water and sanitation services undermines public health and is a main contributing factor to PNG’s high infant mortality rate (39.8 deaths per 1,000 births in 2019). In the current situation, poor access to handwashing facilities results in poor hygiene and impedes effective measures to control the COVID-19 pandemic. The average incidence of diarrheal diseases in children (under five years old) in Papua New Guinea is 243 per 1,000, although in some provinces the number exceeds 500 per 1,000 children.

Access to ICT services has increased slowly in recent years and prices have fallen, though significant gaps remain. Eighty percent of the population lives within mobile coverage range, and the 3G network covers 40.9 percent of the population. However, fixed and mobile subscriptions combined cover just 11.4 percent of the population. Prices for ICT services, which have consistently ranked as some of the highest in the world, have declined in recent years owing in part to regulatory intervention.

There are four serious constraints to improving the stock and service quality of infrastructure in Papua New Guinea.

1. Geography is first and foremost. Papua New Guinea consists of 600 islands with over 5,000 km of coastline, mountains up to 4,500 meters in altitude, active and recently active volcanoes, and swamps and floodplains. The country is vulnerable to natural disasters, including cyclones/hurricanes/typhoons, earthquakes, tsunamis, drought, flooding, landslides, and volcanic

activity. It is difficult and expensive to build and maintain roads and other means of transportation in such an environment. In turn, the lack of adequate transportation access makes it difficult and costly to provide energy, water and sanitation, and ICT infrastructure.

2. In each of the sectors, a lack of policies and coordination, regulatory impediments, weak financing and investment strategies, and limited organizational and human resource capacity hinder infrastructure development.
3. Papua New Guinea's customary land tenure system makes it complicated to get an unobstructed title to the land needed for infrastructure.
4. The COVID-19 pandemic has prompted a major economic downturn, reduced business activities and heightened affordability constraints, weakening the financial sustainability of energy, ICT, and water service providers.

In spite of these constraints, there is also much to build on. The abundance of natural resources provides the country with significant financial means. In the energy sector, for example, the government has set the ambitious goal of reaching 70 percent access to electricity by 2030 and becoming fully carbon-neutral by 2050. It is already working to implement the National Electrification Rollout Plan for the country with support from development partners. In the transport sector, improving transport infrastructure with sustainable and disaster-resilient qualities is a national-level priority, to which both the government and development partners are strongly committed. The sector has gone through comprehensive assessments such as expenditure and institutional reviews and has embarked on a comprehensive reform to enhance efficiency. In the water and sanitation sector, transformative policies and regulation are ready to be approved. Two water utilities serving urban areas are, despite some inefficiencies, strong enough to potentially play an important role in further expanding water and sanitation coverage in peri-urban and rural areas. In the ICT sector, the recent completion of the Coral Sea Cable may lead to further cost reductions. The completion of Kumul Domestic Submarine Cable and the introduction of low-cost handsets by mobile carriers will encourage increased uptake and spread the benefits of the Coral Sea Cable.

Papua New Guinea can improve its infrastructure situation by strengthening policy design, investment planning, and coordination among agencies and with development partners. It will also be important to introduce good sectoral and corporate governance and accountability, improve the operational and financial performance of the agencies in charge of infrastructure, and improve the balance between infrastructure investment and maintenance. In addition, it will be increasingly important to find ways to involve the private sector in providing and maintaining the country's infrastructure—for that, adequate regulation is a must.

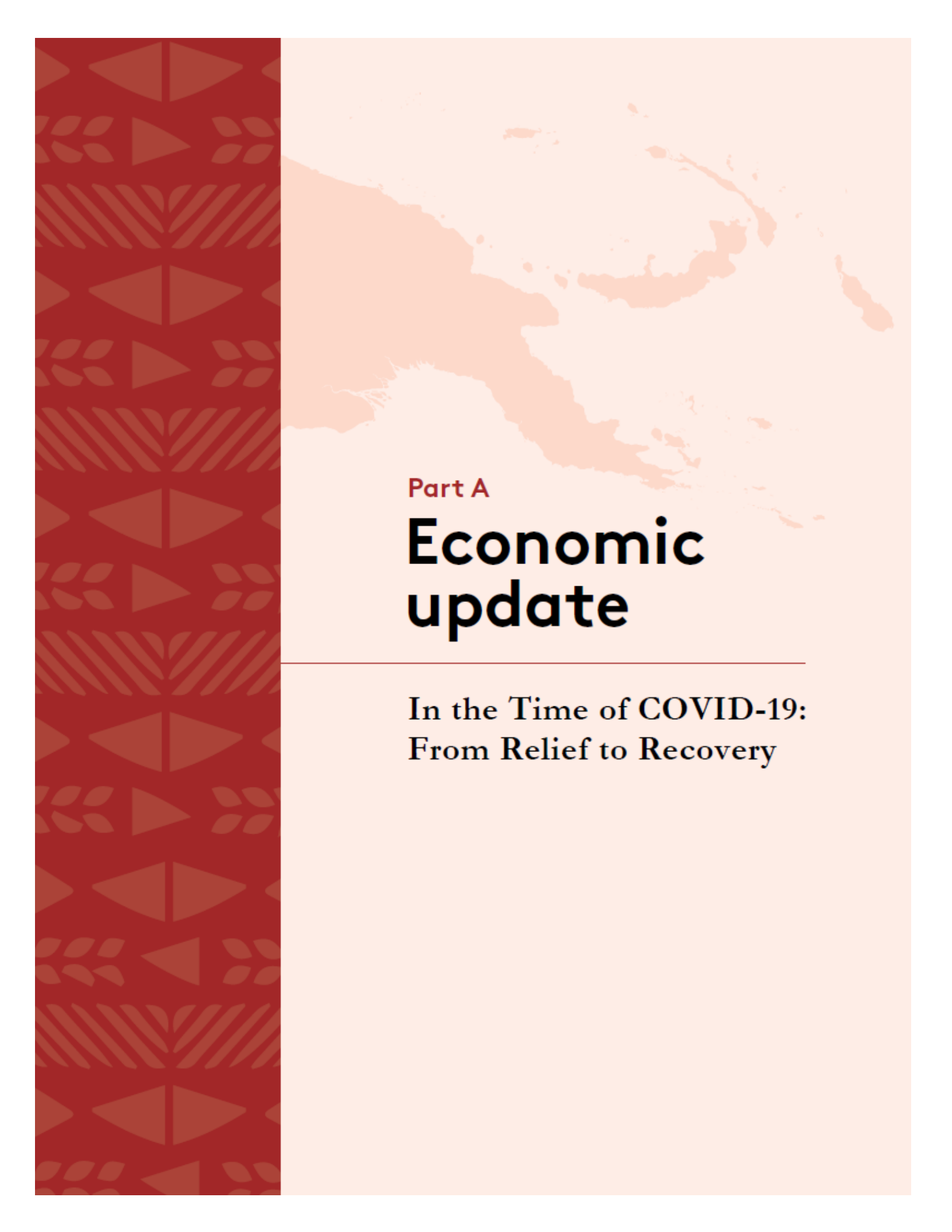
For the energy sector, the government target of 70 percent electrification is ambitious but achievable. It is estimated that roughly US\$130 million in investments are needed annually up to 2030 to meet the electrification target, which comprises approximately 60 percent on-grid (distribution) and 40 percent off-grid investments. Creating an enabling policy and regulatory environment for electrification is a key priority to catalyze these investments. Significant institutional development is needed for better sectoral and corporate governance and accountability, improved operational and financial performance of the power utility, and vibrant private sector participation for the successful implementation of the electrification program.

For the transport sector, the focus should be placed on consistent and implementable plans. For the road subsector, the priority should remain on maintaining the existing network—including the adequate funding of such maintenance—before extending the current network, the cost of which would be high given the country's geographic constraints. For the most vulnerable people (those without year-round road access), priority should be given to investments in jetties and wharves, to allow for safe operations for passengers and cargo. The state-owned enterprises (SOEs) that oversee more significant aviation and maritime infrastructure

investments are doing relatively well. Future investments to expand their operations and facilities can be assessed and reviewed with the relevant entities. For all transport subsectors, an integrated policy is required to better clarify the government's priorities. Finally, a strategy to strengthen the capacity of government employees and other stakeholders to oversee, manage, and operate transport operations is urgently needed.

There is an urgent need to strengthen policy development and coordination for water, sanitation, and hygiene (WaSH) by formally establishing the National Water, Sanitation, and Hygiene Authority and by adopting legislation to regulate the sector. These measures need to be supported by developing improved planning, financing and implementation mechanisms for WaSH, especially at district level, and by implementing sector capacity building programs and monitoring. The two water utilities in the country need to be incentivized to expand WaSH service delivery to peri-urban areas and provide support to rural areas. An estimated US\$150–200 million annually is needed for investments in infrastructure, operations, and maintenance to meet the government's 2030 WaSH targets. This funding requirement is to be met primarily from public funds, household contributions, and international development contributions—until the water utilities can become creditworthy and start accessing private capital.

Digital infrastructure/ICT is critically important to Papua New Guinea's medium-term development given the rapid advance of the digital economy globally and in the Pacific region. The government is advised to seize the opportunities presented by the completion of the new submarine Coral Sea Cable to facilitate much more widespread and affordable access to both fixed and mobile broadband services. In particular, the government should reorganize and improve the performance of the telecommunications/Internet service SOEs under Kumul Consolidated Holdings Limited to allow for greater private sector participation, which will strengthen their ability to compete in the market. The government is further advised to improve the competitiveness of wholesale Internet access and pricing by introducing reforms to the way PNG DataCo manages submarine cables. In addition, the National ICT Authority is strongly recommended to fast-track regulations on tower sharing for mobile broadband, passive infrastructure sharing for fixed broadband, and mobile number portability to allow for more effective competition. Finally, to make full use of the new capacity delivered by the Coral Sea Cable, the government can stimulate demand through digitization of its own services—for example, development of effective platforms for e-education and e-health services.



Part A

Economic update

In the Time of COVID-19:
From Relief to Recovery



Telikom PNG launches a COVID-19 helpline. Photo: Telikom PNG.

1. Recent economic developments

1.1. Economic growth

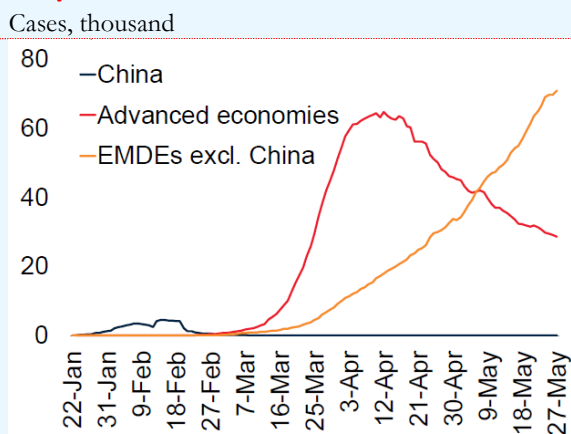
1. **COVID-19 protection measures are severely impacting economic activity worldwide.** Economic forecasts are changing week by week, with the impacts of social distancing measures, lockdowns, and travel restrictions affecting global supply and higher unemployment, business failures, and reduced incomes lowering global demand. The most recent numbers anticipate global output to fall by 5.2 percent in 2020, an unprecedented decline, and considerably higher than the 1.6 percent contraction following the financial crisis of 2008–09 (World Bank 2020e). Impacts have been felt in equity markets, commodity prices, sovereign bond spreads, trade levels, and investor confidence. We are only now starting to understand the first-round effects of the economic shutdowns, increased government spending, and falling tax revenues. Considerable uncertainty surrounds the magnitude of second-round impacts, including supply disruptions, increased business costs, consumer behavior changes, financial system instability, and capital flow reversals. As a result, the global growth forecast for 2020 will remain extremely fluid.

2. **For Papua New Guinea, the immediate impact of COVID-19 will be felt through impacts from the national lockdown, affecting supply of domestic services; longer-term effects will come through changes to investment decisions.** Papua New Guinea declared a state of emergency on March 24, which closed schools, universities, and non-essential public services and grounded all domestic and international flights. The authorities lifted much of the lockdown in late April, and businesses—including hotels, restaurants, and banks—were permitted to operate, and public transport resumed. Borders remain closed, with some restrictions on international and domestic travel lifted for certain categories of travelers. As of late June, there were more than ten confirmed cases of COVID-19 in Papua New Guinea. While the country has avoided the health emergency seen elsewhere in the world (Box 1), global events may influence investment decisions for extractive and other investments, potentially delaying or even indefinitely postponing final investment decisions.

Box 1. The global spread of the pandemic
Worrying developments for emerging market and developing economies

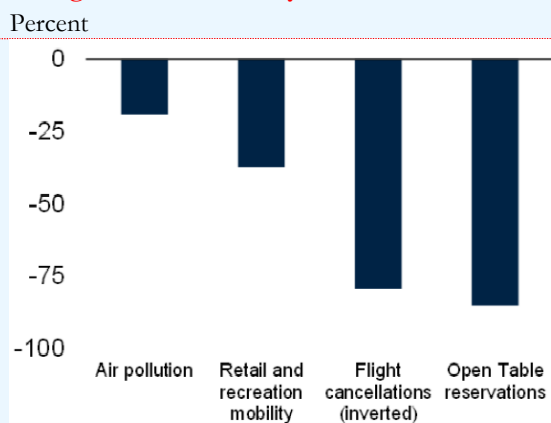
On March 11th, the World Health Organization declared COVID-19 a pandemic—the first such declaration since the swine flu outbreak of 2009. The COVID-19 pandemic has spread with astonishing speed to every part of the world and infected millions. The health and human toll is already large and continues to grow, with hundreds of thousands of deaths and many more suffering from diminished prospects and disrupted livelihoods. As of June 30, 2020, over 10.5 million cases of COVID-19 have been confirmed globally, with more than 500 thousand deaths attributed to the disease. Although the number of confirmed cases represents just 0.13 percent of the global population, cases continue to rise rapidly in most countries, including in emerging market and developing economies (EMDEs).

Daily New COVID-19 Cases



Source: Global Economic Prospects.

Change in Global Activity Indicators in 2020



Source: Global Economic Prospects.

The pandemic represents the largest economic shock the world economy has witnessed in decades, causing a collapse in global activity. As infections and deaths soared, governments around the world have taken unprecedented measures—including lockdowns and quarantines, school and business closures, and travel restrictions—to stem the spread of the pandemic and ease the strain on healthcare systems. These measures, together with the spontaneous reactions of consumers, workers and businesses, have caused severe disruptions to activity in many sectors and a sharp global economic downturn. This has been accompanied by record capital outflows from EMDEs, a collapse in global trade of goods and services, and a plunge in oil demand.

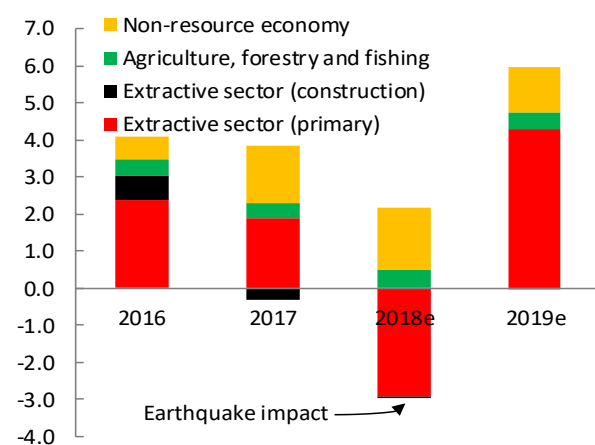
One feature of COVID-19 is that its lethality has been highest among the elderly (CDC 2020). This may help lower the case fatality rate in EMDEs, which typically have younger populations. The proportion of the population older than 60 years is 11 percent, on average, in EMDEs, and only 5 percent in low-income economies, compared with 26 percent in advanced economies. However, EMDEs generally have poorer public health and medical care systems than advanced economies, making the likelihood of recovery from COVID-19 lower should medical attention be needed. The average low-income economy, for instance, has 0.4 hospital beds per 1,000 people—less than one-tenth of the number in the average advanced economy. Finally, a higher proportion of the population of EMDEs live in informal, crowded housing conditions where access to clean water and sanitation services is limited, making the hygiene and physical distancing measures needed to contain the virus impractical or impossible (Corburn et al. 2020).

Source: Global Economic Prospects, June 2020; with some data updates.

3. However, not all of the news is bad, as Papua New Guinea is relatively insulated from the economic impacts of COVID-19 in comparison to many of its fellow developing EAP neighbors. Caseloads have been small, and hospitals have been able to cope so far. Falling energy prices will lower the import costs of fuel and will not have a significant impact on government revenues from gas exports as these were small even when prices were high (Box 2). The gold price has been rising since 2015, reaching a seven-year high in May 2020. As a result, the terms of trade have moved in Papua New Guinea's favor over the past year, with trade-weighted agricultural and commodity prices rising 4 percent overall (helped in large part by the rising gold price). In contrast to many Pacific states, tourism is negligible in Papua New Guinea, limiting the impact of international travel restrictions. At the same time, remittance income from Papua New Guineans' working overseas is less than 0.1 percent of GDP, cushioning the impact of a decline in this income stream. Finally, Australia, a key trading partner—which purchases 23 percent of Papua New Guinea's exports and supplies 46 percent of its imports—has also successfully contained the virus so far, giving cause for hope that regional economic disruption will be less than in Europe or the Americas.

4. In 2019, other domestic issues influenced the economy, with a supply-side push in the extractive sector and weaker demand in the non-resource economy. Real GDP growth in 2019 is now estimated to have been 6.0 percent, rebounding from the earthquake-affected contraction of 0.8 percent in 2018 (Figure 1). While, the extractive sector rebounded from a contraction of about 11 percent in 2018 to an expansion of over 16 percent in 2019 (due to a normalization of production), growth in the non-resource economy slowed from 3.1 percent in 2018 to 1.9 percent in 2019 as the impact from Papua New Guinea's hosting of high-level meetings of the Asia-Pacific Economic Cooperation (APEC) forum faded away and foreign exchange issues continued to weigh on business sentiment. The slowdown in construction has been particularly marked, with bank lending to the sector down 20 percent year on year and employment down more than 9 percent despite a rise in the imports of construction materials (up 7.7 percent in U.S. dollar terms after adjusting for inflation) (Figure 2).

Figure 1. Real GDP growth 2016–19
(Percentage point contribution to growth)



Source: World Bank staff estimates.

Figure 2. Other indicators of 2019 economic activity
(Constant prices, annual percentage change)

	2019
Motor vehicle imports	+4.9
Construction material imports	+7.7
Non-mineral exports	-12.5
Formal sector employment	+2.0
GST Collection in Provinces	+17.6
Credit to non-extractive businesses and households	+3.6

Sources: <https://www.trademap.org/>; BPNG Quarterly Economic Bulletin; Final Budget Outcome, 2019.

5. In the resource sector, both non-renewable extractives and renewable agriculture, there was a mix of supply and demand-side effects. In the extractive sector, production of liquefied natural gas (LNG) returned to its pre-earthquake levels, with production reaching 8.5 million tons and 111 shipments. Gold production was at record highs, with 73.9 tons mined in 2019, up 17 percent year on year, and beating the previous record of 72.8 tons set in 2000. However, gold output in 2020 will be affected by the closure of the

Porgera mine, which produces around 20 percent of Papua New Guinea's gold. Volumes of all major agricultural exports fell in 2019, the most significant being palm oil, an important source of employment in some rural areas. A recent outbreak of African Swine flu in the Highlands will hurt some households and may push up prices and lower access to meat.

Box 2. Falling oil prices and Papua New Guinea
Not necessarily bad news

The COVID-19 pandemic saw a dramatic fall in energy prices, with prices of oil futures contracts in North America even turning negative for April delivery as storage capacity reached its limits. But how will these falls in prices affect Papua New Guinea, a major energy exporter?

About 80 percent of Papua New Guinea's energy exports are in the form of liquefied natural gas. Around 90 percent of this is sold under long-term contracts to buyers in Japan, China, and Taiwan, China, with customers including Osaka Gas in Japan and the CPC Corporation, the state-owned petroleum and natural gas company in Taiwan, China. The remaining 10 percent of production is sold as 'spot price' shipments, mostly to China for electricity generation.

While the details of long-term LNG supply contracts are not made public, generally they are linked to the oil price through the Japanese Crude Cocktail. This arrangement harks back to how the first LNG shipments in the 1960s and 70s to Japan were priced as a substitute for oil imports. The link to oil prices remains, with LNG measured in millions of British Thermal Units (mmBtu) with 1 mmBtu containing the equivalent energy of 15 percent of a barrel of oil. This 15-percent ratio is used to price LNG; if the oil price were US\$50 a barrel, 1 mmBtu of gas would be priced as 15 percent of this, plus an extra US\$0.50 to cover the price of shipping, so at US\$50 a barrel the LNG price would be $US\$7.50 + US\$0.50 = US\$8.00$ a mmBtu.

This is the basis for pricing PNG LNG's long-term supply contracts. Prices received in Q1 2020 were a healthy US\$9.08 per mmBtu, compared to spot prices in the region of US\$3.70, a sizeable difference. However, this reflects a lag between falling oil prices, the reported Japanese Crude Cocktail price and the eventual revenues received by PNG LNG. With oil prices hovering at US\$30 a barrel, revenues likely fell to around US\$5 per mmBtu in the second quarter of 2020. However, LNG supply contracts often include a 'kink' in the pricing formula (a so-called 's-curve') that protects the seller in times of very low prices, and protects the buyer when prices are high—this may soften the fall in revenues from lower oil prices.

So, what does all this mean for Papua New Guinea's economy? The PNG LNG project will continue to produce at or near capacity, in order to fulfil existing long-term contracts—so volumes of production and, hence, real GDP will not be affected. Nominal GDP will be impacted, however, as LNG prices fall—the costs of production are unlikely to decline, hence profits and value-added will fall. As for government revenues, these are minimal even when prices are high, with only PGK 1.1 billion received from the resource sector in 2019. Potentially, dividends from the government's shareholding in the project will suffer, but these have been small, and given the opacity surrounding these payments, the impact of lower prices on dividend payments will be more difficult to assess.

The greatest risk from lower energy prices comes from any potential delays in future oil and LNG projects. Low energy prices, together with COVID-19-related uncertainties, will weigh on investor sentiment. Nonetheless, LNG projects are long-term investments that look 10, 20, or 30 years into the future, and are less affected by short term volatility. The latest World Bank Commodity Markets Outlook (World Bank 2020d) forecasts the LNG price will stay above US\$8 per mmBtu in 2020 and remain at that level for the next decade.

As a footnote to this analysis, it is worth noting that Papua New Guinea is also an importer of energy, in particular fuels for vehicles and electricity generation. In 2019, PGK 1.0 billion (1.2 percent of GDP) was spent on energy imports, accounting for 9 percent of total goods imports. The approximate halving of oil prices so far in 2020 could save up to PGK 500 million in import costs, which compares to the PGK 934 million the government received in taxes, royalty payments, and dividends from LNG sales in 2018.



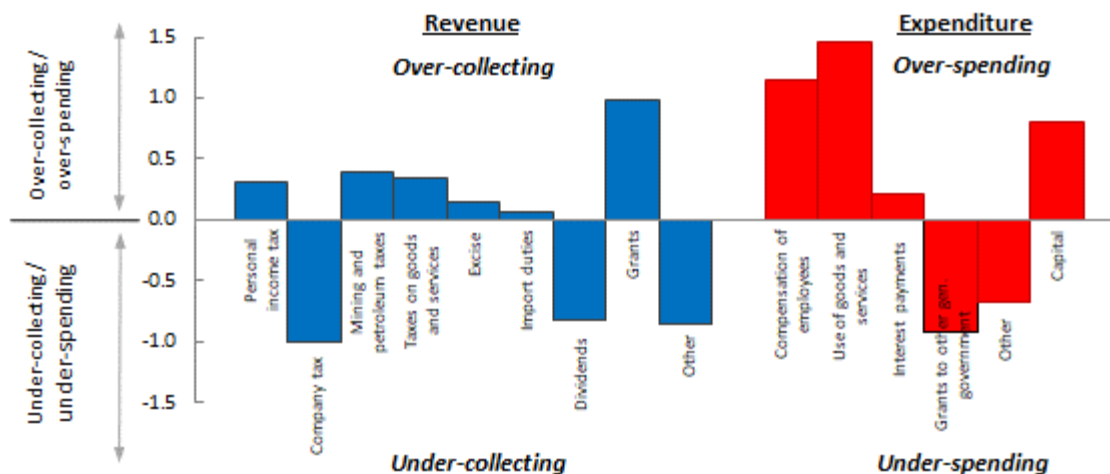
A modest economic stimulus package will be financed by additional budget support and grants from development partners. Photo: Front page of the Ministerial Statement on an Economic Stimulus Package.

1.2. Fiscal developments

6. **2019 was another year of over-spending and under-collecting.** The overall fiscal deficit was 4.9 percent of GDP, compared to the original target of 2.3 percent of (revised) GDP, set under the previous government. Total revenues were PGK 13.7 billion, a fall from 2018 receipts of PGK 14.1 billion. Overall, the revenue forecasts in the 2019 budget proved too optimistic, with significant underperformance of company tax and dividend receipts (Figure 3). However, taxes on personal income and goods and services did perform well, exceeding both their budget targets and 2018 collections, reflecting good efforts made over the past years to strengthen the Internal Revenue Commission (IRC). The 'other' category underperformed by over 1 percent of GDP, the largest contribution to which was the lack of any transfer from the sovereign wealth fund, budgeted to provide PGK 428 million in 2019. These budgeted transfers are complicated for two reasons: (i) under international statistical standards such a transfer would not be considered 'revenue' but rather a financing item and (ii) the sovereign wealth fund is empty—hence this item would be better considered as a financing gap; this sleight-of-hand should be discouraged in future budgets.

7. **The non-resource primary balance (NRPB) was -5.2 percent of non-resource GDP in 2019, against a target of -2.7 percent.** The Fiscal Responsibility Act requires the government to target a zero average NRPB over the medium term, a core measure of the government's Medium-Term Fiscal Strategy. The target stated in the 2020 budget was that the NRPB should reach +0.4 percent of non-resource GDP by 2024, which will then allow revenues to flow to the currently-depleted sovereign wealth fund. These targets will likely need reconsideration in light of the additional spending and borrowing necessitated by the impacts of COVID-19.

Figure 3. Revenue and Expenditure Performance against Original 2019 Budget
Percent of 2019 GDP



Source: Final Budget Outcome, 2019 and Budget 2019 Volume 1; PNG Treasury.

8. **Low company tax revenues and dividend receipts were partly offset by higher than anticipated grants from foreign governments.** Falling company tax receipts are a continuation of a trend since 2014—when they reached PGK 2.5 billion—and reflect a steady decline in corporate profitability since the peak in commodity prices. The original budget target of PGK 2.6 billion for 2019 now looks unduly optimistic and created a PGK 600 million revenue shortfall. Dividend payments also undershot, largely due to Kumul Petroleum Holdings Limited transferring only PGK 250 million against a hoped-for transfer of PGK 1 billion, which as noted in previous editions of the PNG EU, underlines the opacity with which revenues from PNG LNG are distributed via GloCo¹ and Kumul Petroleum Holdings Limited. For the second year running grants from foreign governments have exceeded their budget expectation, with PGK 1.8 billion received. This pattern of revenues underperforming and grants overperforming is a deliberate strategy to ensure that overall revenues are not unduly optimistic—with stretching targets set for domestic revenues, counterbalanced with the conservative target for grants acting as a safety net.

9. **Expenditures were 2.0 percent of GDP higher than originally budgeted, continuing a long trend of exceeding budget limits and addressing budget arrears from previous periods.** Use of goods and services saw the highest overspend at PGK 1,235 million (1.5 percent of GDP), with these concentrated at the National Department level—goods and services spending in the provinces *lower* than budgeted. Additional goods and services spending totaling PGK 350 million was linked to donor activities, mirroring the increase in grant receipts discussed above. Arrears totaling PGK 457 million were reported as being cleared in 2019, with PGK 295 million paid to contractors for capital projects, and PGK 161 million for rental costs and utility payments. Perhaps worryingly from a transparency perspective, the largest overspend detailed in the Final Budget Outcome (FBO) is for PGK 585 million, registered under “Treasury and Finance – Miscellaneous” with no further details provided.

10. **Low recorded levels of spending at the provincial level may indicate a risk of accumulating spending arrears.** Grants to other levels of government were PGK 779 million (36 percent) lower than originally budgeted, reflecting a slashing of this budget line in the supplementary budget. These cuts will impact on service delivery levels and could potentially be an indication that, as in previous years, arrears are accumulating in the provinces that will need to be paid in the future. These situations can create sizable

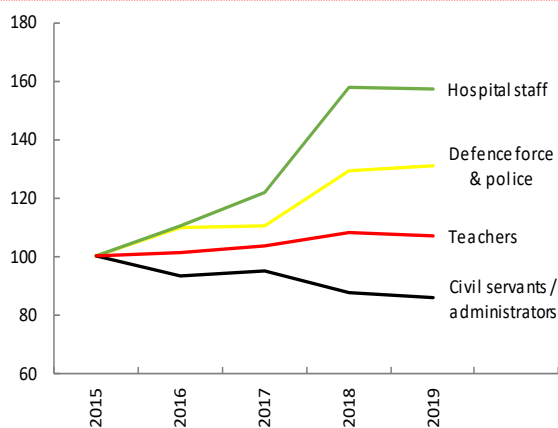
¹ PNG LNG Global Company LLC, operated on behalf of all co-venture partners by ExxonMobil PNG Ltd.

inefficiencies—for example, staff are paid but cannot do their jobs for lack of equipment and materials. Settling outstanding arrears also incurs fiduciary costs—supplier invoices resubmitted for payment that are over a year old are more at risk of fraud and malpractice, and can be seen as a ‘one-way bet’ by suppliers who resubmit old invoices with the hope that it will be paid twice. This all points to the need for realistic annual budgeting at the outset to avoid large midyear changes that, in turn, create further problems such as payment arrears.

11. **Recruitment of teachers, health care workers, and the police caused wages and salaries spending to climb further.** Personnel emoluments spending has exceeded the initial budget estimate for every year since 2010 and has long proved a challenge for the national government to control. Numbers released in the 2019 FBO shed some light on recent developments in public employment. Staff numbers in hospitals have been increasing, averaging over 9 percent growth each year since 2015 (Figure 4). The number of defence force and police have also been rising by over 5 percent per year, while the number of teachers, who form the largest single block, have been growing by 1.4 percent per year. Staff numbers in both national and provincial administrations have been falling. Meanwhile, average salary levels are increasing, reaching PGK 44,300 per year in 2019 (Figure 5), up 8.6 percent compared to 2018 (equivalent to around US\$1,100 per month).

Figure 4. Public Sector Employment Changes

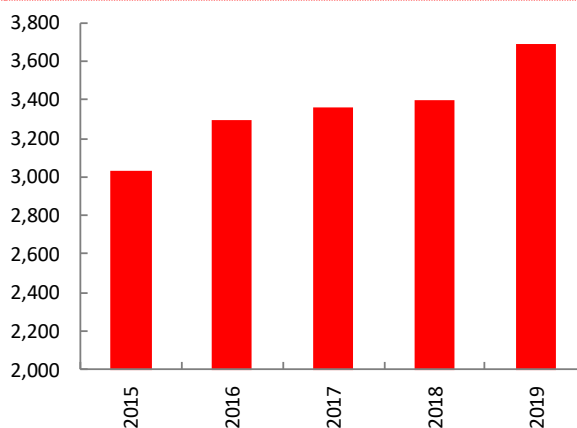
(Index, 2015=100)



Source: Final Budget Outcome, 2019.

Figure 5. Average Monthly Wages and Salary Cost per Public Sector Employee

(Kina)



Source: Final Budget Outcome, 2019.

12. **Given that the government is the largest employer in the country, and that the wage bill takes up 38 percent of total spending, greater scrutiny and analysis of the government payroll would be beneficial.** The publication of employment numbers in the 2019 FBO is a positive first step. Greater transparency and monitoring of public employment can help the government direct staffing to where it is needed and away from low-priority areas. Even with recruitment and salary freezes, increased allowances and average seniority levels can drive up payroll costs. It can be useful to track promotions and the grade profile of the workforce to monitor if there is a ‘seniority creep’ pushing up costs. Monitoring the age profile of employees helps to anticipate retirements better. Papua New Guinea is taking steps in this direction. In 2016, the government established the Organisational Staffing and Personnel Emolument Audit Committee to oversee payroll audits and introduce improved system controls.

13. **Public capital spending totaled PGK 3.2 billion (3.8 percent of GDP) in 2019, the highest since 2014.** Capital spending in Papua New Guinea is perhaps better titled ‘spending on projects’ and comprises a handful of large, often externally-funded projects (Table 3) and a long tail of smaller projects funded from domestic resources (Table 4). The large donor projects are chiefly in the transport sector, with roads dominating

this portfolio. The oversight of the long tail of capital spending is still grappling with transfers to provinces and districts with almost one-quarter of total capital spending recorded as some form of transfer to a subnational body (chiefly through the District Services Improvement Programs). For many years, observers have highlighted the lack of transparency on how these funds are spent and whether they achieve the government's development objectives.² The clearing of arrears from 2018 and the Special Intervention Program are also large and opaque spending areas.

Table 3. Largest Loan-Financed Capital Projects, 2019

Project	Partner	Total project cost	
		US\$, millions	PGK, millions
Sustainable Highlands Highway Investment Program, Tranche 1	Asian Development Bank	313	1,060
Civil Aviation Development Investment Program, Tranche 3	Asian Development Bank	248	840
PNG National Power Grid - Mt. Hagen, Mendi, Tari	China	137	463
Highlands Region Roads Improvement Program, Tranche 3	Asian Development Bank	129	438
Lae Tidal Basin (western side)	China	103	350
Keltiga Junction to Kagamuga Airport Four Lane Highway Reconstruction and Upgrade	China	78	265
New Boram General Hospital Development Project	European Union	89	300
Ramu Transmission System Reinforcements Project	Japan	77	259

Source: Asian Development Bank; press reports.

Table 4. Largest Domestically-Funded Capital Projects, 2019

Project/budget line	Total project cost	Spending in 2019
	PGK, millions	PGK, millions
District Services Improvement Programs (22 in total)	890 ³	1,106
Capital Investment Arrears	-	284
Special Intervention Program	-	201
District/Rural Hospital Redevelopment (23 hospitals and health centers)	250	64
Rehabilitation of District Plant Transport Division Workshops: Tools & Equipment (road maintenance)	320	60
Waigani Court House	610	53
Bougainville Infrastructure	-	50
Western Pacific University	119	30

Source: Budget documents, various years; Final Budget Outcome, 2019.

14. **The Papua New Guinea authorities' response to COVID-19 covers (i) emergency health and security measures, including the repatriation of citizens from abroad; (ii) social support and price controls; and (iii) business and liquidity support.** On April 2, the Minister for Treasury forecasted that government revenue would be around PGK 2 billion lower than anticipated,⁴ and a range of measures would be introduced to help finance the (now larger) budget deficit, and to help cushion the impacts of the pandemic.

² See DSIP research.

³ Budget allocation for 2019, rather than total project cost.

⁴ A revenue shortfall of PGK 2 billion is not particularly unusual; in 2016 domestic revenues undershot by PGK 2.1 billion, and in 2019 the gap was PGK 1.4 billion.

The National Economic Council approved additional spending of PGK 600 million for the on-budget fiscal stimulus, of which PGK 280 million is for emergency health and security measures. The remaining PGK 320 million is for the rural sector, micro, small, and medium-sized enterprises (MSMEs), and some additional economic stimulus, to be defined later (Table 5). Development partners have allocated about PGK 135 million in co-financing for the Emergency Preparedness and Response Plan. The private sector also agreed to participate in the economic support program, with commercial banks providing loan repayment holidays and superannuation funds releasing employees' savings (of up to PGK 10,000 per person) in cases of temporary unemployment during the COVID-19 crisis. The total COVID-19 response package totals about PGK 1,835 million (2.2 percent of GDP), which is an appropriate size, given that Papua New Guinea does not have any fiscal buffers to draw upon. The government is planning to finance the crisis response plan by issuing COVID-19 bonds and attracting development partner financing in the form of grants, COVID-19-related projects, and additional budget support loans.

Table 5. COVID-19: Government Response Plan and Financing Sources, 2020

(In PGK million)

	COVID-19 response measures	Implementing agencies	Budget increase		Off-budget support	Subtotals/ total
			NEC allocation	Donor-funded projects/grants		
Protecting lives	Health and security measures		275	135		410
	Emergency Preparedness and Response Plan	NDoH, PHA, DDA, jointly with WHO	127	70-WB project; 65-grants*		262
	Extra police and defense forces; citizen repatriation	Constabulary, Defense Force, DFA&IT	148			148
Supporting livelihoods	Social support and price controls		5		500	505
	Unemployment support in the formal sector	Superannuation funds			500	500
	Social/food assistance to the informal sector	Churches, city/urban authorities	5		PM's half salary	5
	Price control of essential food/ household commodities	ICCC				
	Business and liquidity support		320		600	920
	Rural sector and MSME support	DSIP/PSIP, DoA, NDB	250			250
	Additional economic stimulus allocation	TBD	70			70
	Loan repayment holidays for 3 months	Commercial banks			600	600
	Tax filing and payment deferrals for 2 months	IRC				
	Liquidity support/ quantitative easing	BPNG				
Immediate Crisis Response Package			600	135	1,100	1,835

Note: *Development partners have allocated nearly US\$19 million in grants for health emergency support, including Australia (AUD20.5 million), the United States (US\$3.5 million), New Zealand (\$NZ 3 million), and China (PGK 1 million).

15. **‘Keeping the receipts’ is vital when administering emergency spending and loan guarantees.**⁵ Fiscal transparency, public accountability, and institutional legitimacy are key to ensuring public support for large, rapidly-disbursing spending programs, and can help avoid criticisms like those leveled against the previous government for its handling of the APEC meetings in 2018, including the air freighting of luxury cars for the conference taxi fleet. Attention should focus on three aspects of the support package:

- i) **Design.** Balance the urgency and timeliness of the response in a volatile economic environment with achieving transparency in the identification and presentation of the response measures.
- ii) **Implementation.** Have adequate control and tracking/traceability of budget and off-budget interventions, to ensure that the agreed emergency measures are deployed effectively and in line with their intended purpose and, if needed, provide an opportunity to revise and adapt the set of measures to changing circumstances.
- iii) **Oversight to ensure that objectives are met.** Put in place comprehensive and transparent reporting and public accountability procedures that oversight institutions (such as Parliament and the Supreme Audit Institution), civil society organizations, and the public can enforce while the support measures are being designed and implemented.

Although following these good practices will not solve all of the challenges involved in administering emergency response measures, they can improve their efficiency and limit external criticism. Acknowledging this, the current government has made a commitment to conduct an audit of COVID-19 funding and provide the audit report to Parliament; this decision was welcomed by the Transparency International PNG.⁶

16. **The COVID-19 crisis and global recession have raised Papua New Guinea’s risk of debt distress from moderate to high.** This significant change is due to the likely increase in external debt following the government’s response to the COVID-19 crisis and an anticipated deficit level of 6.4 percent of GDP in 2020, when the debt-to-GDP ratio is forecast to reach 47 percent. Of concerns are the large external debt repayments due in 2028, which place a significant strain on the country’s debt repayment capacity. These payments are considered at risk should Papua New Guinea experience another shock in the future. The International Monetary Fund (IMF), which led the assessment, notes that “public debt is assessed to be on a sustainable path, conditional on the implementation of prudent fiscal policies following the commitments of the staff-monitored program” (IMF 2020b). The IMF calls for greater revenue mobilization and expenditure restraint, which will help to lower the risks of debt distress.

17. **The authorities have launched a Staff Monitored Program with the IMF, which has since been augmented by a COVID-19 Rapid Credit Facility (RCF) loan.** A Staff Monitored Program (SMP) is a non-lending program whereby the country authorities agree on a set of quantitative targets and structural benchmarks to be achieved over the coming one or two years (IMF 2020a). It is designed to signal to international investors, development banks, and foreign governments that the authorities are taking reform seriously, backed up with a stamp of IMF quality assurance. Papua New Guinea’s SMP, agreed in February, set targets for the fiscal deficit, clearing spending arrears, improving tax performance, and straining spending. However, COVID-19-related events have overtaken the SMP, with a US\$364 million (approximately 1.6 percent of GDP) emergency RCF loan agreed in June 2020 (IMF 2020b). Financing under the RCF carries a zero interest rate, has a grace period of 5.5 years, and a final maturity of 10 years.

⁵ For a further discussion, see the IMF’s Special Series on Fiscal Policies to Respond to COVID-19 at <https://www.imf.org/en/Publications/SPROLLS/covid19-special-notes>.

⁶ See LoopPNG online article available at <http://www.looppng.com/png-news/govt-acknowledged-commitment-accountability-92177>

Box 3. The state of emergency and economic activity
Adjusting to the 'new normal'

Papua New Guinea declared a state of emergency on March 24, with many 'non-essential' businesses and public institutions shuttered for roughly three months. The experience of Paradise Foods, a major processed foods and bottled drinks manufacturer, gives a sense of how households and businesses responded to these events. Although sales of ice cream fell to near zero, the state of emergency saw a 50-percent increase in demand for staples, in particular its PGK 1 products, including packs of biscuits and bottled water. Paradise hired 45 additional staff to cope with this extra demand, while redeploying the employees on its ice cream production line. Production costs increased slightly as transport for workers had to be organized given the halt in public transport, but otherwise production continued as normal. Imports of flour and milk powder were not disrupted, and domestic supplies of other inputs could be met from stockpiles or continued deliveries.

The CEO of Paradise Foods, James Rice, felt that things were returning to normal when he saw children eating ice cream again after the lockdown ended. The lockdown presented a major obstacle for this firm, but the resilience of the supply chain and the quick return to normality provides some hope that Papua New Guinea will bounce back quickly after the pandemic.





The Central Bank has injected more liquidity into the market to cope with the COVID-19 crisis.
Photo: One PNG News Online.

1.3. Monetary policy and price developments

18. In response to the health and economic crisis, the Bank of Papua New Guinea (BPNG) announced a series of immediate policy measures to boost market liquidity, including a reduction in the Kina Facility Rate (KFR)⁷ from 5 to 3 percent. Monetary loosening started in 2019 when the BPNG reduced the KFR three times during the year in response to disinflationary pressure. To contain the economic fallout from the COVID-19 pandemic, the BPNG also introduced additional policy measures, including a reduction in the cash reserve requirement from 10 to 7 percent, relaxation of prudential standards, and the introduction of repayment holidays. The government announced its support to commercial banks by suspending loan-loss provisioning for affected loans during this period to cover their losses arising from a three-month loan repayment holiday. However, the details of many of the announced policy measures remain unclear.

19. In the absence of a well-functioning monetary transmission mechanism, these policy measures may fail to stimulate the economy adequately. The previous rate cut episode underscored this issue. Due to the build-up of excess liquidity in the banking system, reductions in the KFR in 2019 were not passed on fully to borrowers by commercial banks (Figure 6). Following the recent monetary policy easing by the BPNG, several banks announced that they would cut rates for borrowers. For example, Bank South Pacific's Indicator Lending Rates declined from 10 to 9 percent, while other banks reduced their variable interest rates

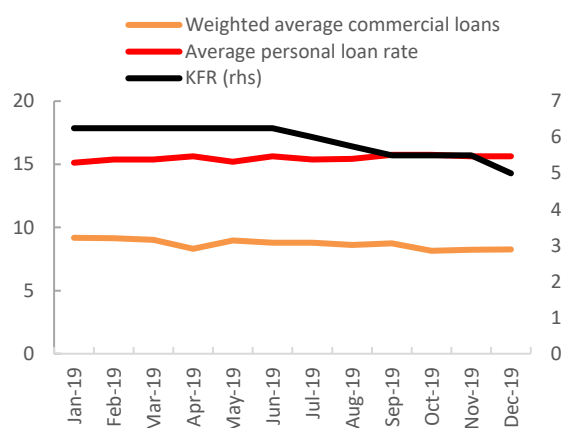
⁷ The KFR is the benchmark interest rate at which funds can be lent or borrowed overnight between banking institutions.

on loans. However, it remains to be seen whether commercial banks will reduce their lending rates or increase their lending levels.

20. **Although bank holdings of free reserves are substantially higher than required reserves, lending rates remain elevated.** Currency holdings and deposits with BPNG (excluding the cash reserve requirement) total PGK 2.1 billion. Excess liquidity in the financial system has not translated into lower lending rates, pointing at high credit risk and limited competition in the banking sector. High interest rate spreads deter both savers (due to low deposit rates) and borrowers (due to high borrowing costs) from participating in financial markets (Figure 7).

Figure 6. KFR cuts have not translated into a reduction in lending rates

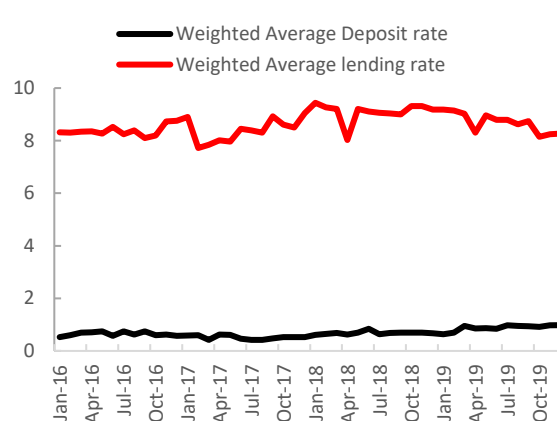
(Percent)



Source: Bank of Papua New Guinea.

Figure 7. Interest rate spreads remains high

(Percent)

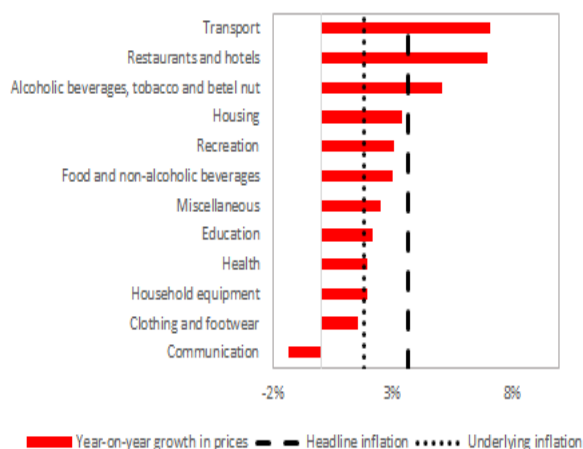


Source: Bank of Papua New Guinea.

21. **As a result, growth in domestic private sector lending has been muted.** Total credit grew by 2.8 percent in nominal terms in 2019, largely driven by lending to households (up by PGK 687 million year on year). Lending to businesses recorded a modest increase. However, the sectoral allocation of credit suggests subdued economic activity during the pre-COVID-19 period. For example, credit to the building and construction sector stood at PGK 444 million in December 2019, the lowest level since 2008. Overall, the share of this sector in total credit in the economy has declined from 10.2 percent in 2009 to 3.3 percent in 2019. Similarly, credit to the agriculture, mining, and manufacturing sectors either recorded declines or remained flat.

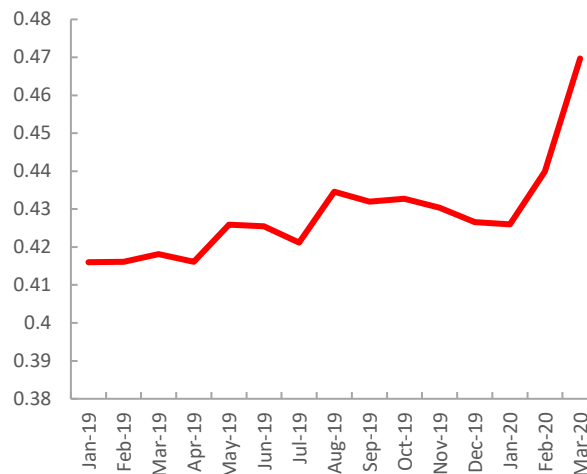
22. **Inflation eased to 3.6 percent in 2019 from 4.7 percent in 2018.** Excluding the price of regulated and volatile goods, underlying inflation was just 1.8 percent in 2019. This deceleration in inflation is explained by several factors, including record low energy prices, which curbed imported inflation. As a result, many import-dependent categories recorded relatively modest growth in price levels (Figure 8). In addition, the appreciation of the Papua New Guinean Kina (PGK) with respect to the Australian dollar (AUD) also contributed to price moderation. By March 2020, the Kina has appreciated against the Australian dollar by 12 percent year on year (Figure 9). The latter tends to have a stronger impact on inflation, including food price inflation, by directly reducing the cost of imports and indirectly reducing the cost of domestically-produced import-competing goods. Reflecting lower global energy prices the “Fuels and Lubricants” category recorded a 2.5 percent year-on-year decline in December 2019. Prices of both diesel and petrol eased throughout the year. Communication services also recorded price reductions, reflecting declining Internet connection prices. The “Health” and “Clothing and footwear” categories also contributed to the easing of inflation. By contrast, transport prices rose by 7.1 percent, spurred by regulated fare increases.

Figure 8. Inflation is slowing due to lower imported inflation and weaker domestic demand
(Percent change, year-on-year)



Source: Bank of Papua New Guinea.

Figure 9. Kina appreciation with respect to the Australian dollar contributed to inflation easing
(AUD/PGK)



Source: Bank of Papua New Guinea.

23. **The early release of retirement savings from superannuation funds risks setting a precedent for the future.** Part of the April 2 COVID-19 response package was to allow superannuation funds to release up to PGK 500 million (0.6 percent of GDP) to members affected by the COVID-19 shock. At around 3.5 percent of total assets in the superannuation funds, this amount is relatively modest. Sensibly, the government asked the superannuation funds how to allocate this money, with a policy objective of supporting jobs, businesses, and investment. This approach should reduce the risks of the policy, but potentially at the expense of slowing disbursement. Policy makers often worry about the precedent that is set when ‘rainy day’ funds are debited; funds are drawn upon again and again whenever some cash shortage emerges, and those facing reduced retirement incomes due to early release lobby government for a top-up or special treatment. Setting clear and transparent rules now can help to set expectations and avoid potential pitfalls in the future.

24. **The BPNG has announced its intention to conduct quantitative easing for a three-month period that would allow it to purchase government bonds via open market operations.** This policy will also allow the Central Bank to keep interest rates on borrowing relatively low. Although the BPNG’s holdings of public debt is substantially below its record-high levels (PGK 1.2 billion in December 2019 compared to PGK 3.0 billion in 2017) the announcement of the quantitative easing program indicates its willingness to inject more liquidity into the economy (Box 4).

25. **The financing of government debt by the BPNG remains a concern.** The January PNG EU flagged this issue as a potential problem that will put pressure on foreign exchange reserves and stoke inflation. Since then, the risk of deficit financing by BPNG has risen on account of the economic consequences of COVID-19. With large tax revenue shortfalls and stimulus-related spending increases, the government is expected to run the highest budget deficit on record. On May 1, the BNPG successfully sold PGK 1 billion (US\$290 million) of so-called COVID bonds with yields ranging from 8 to 9.5 percent for two, three, and five-year bonds. In comparison, the interest rate on one-year Treasury Bills was 7.20 percent. This was the first tranche of a total of PGK 2.5 billion in COVID-19 bonds that the government intends to sell following the launch of its fiscal stimulus package in early April. However, in the absence of investor appetite for lending to the government and failure to secure the necessary funding from development partners, the BPNG may need to intervene directly to finance the budget deficit.

Box 4. The dangerous task of deficit financing
Deficit financing combined with demand recovery may create inflationary pressure

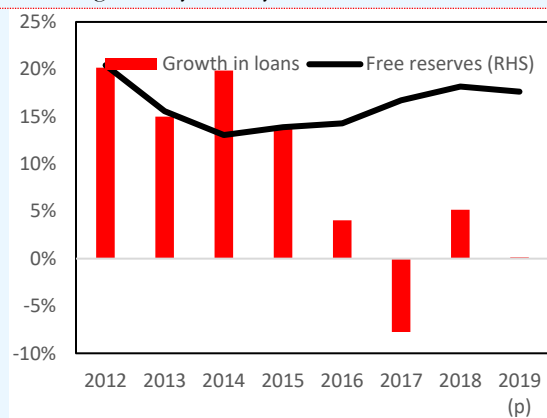
Quantitative easing (QE) has been widely used in advanced economies as a tool to provide liquidity to financial markets. QE works through the central bank buying government (and sometimes corporate) debt from commercial banks, thus increasing the cash holdings of banks, which is then hoped to encourage additional lending to households and businesses, and at lower interest rates. Crucially, central banks ‘print’ the money used to buy these debts. In April 2020, the BPNG announced its intention to buy back government bonds in the open market as part of a ‘quantitative easing’ policy in the hope this would encourage more lending to households and businesses. However, certain factors make this policy choice a dangerous one for Papua New Guinea.

As mentioned in the text, commercial banks are not short of cash, indeed they hold cash well in excess of legislated levels. Rather other factors are at play as to why commercial banks do not lend more, namely the perceived credit risks from lending to the private sector, and plentiful opportunities to buy government debt as the ‘next best alternative’. The economic uncertainties stemming from the COVID-19 crisis make the prospects of private sector lending even more uncertain.

Potentially then, a policy of QE may simply lead banks to use additional funds to purchase more government debt, including the COVID-19 bonds issues in April 2020. Given past experience, an increase in the supply of loanable funds is unlikely to reduce interest rates and, therefore, is unlikely to impact private sector and household lending. As such, quantitative easing is likely to indirectly result in additional central bank financing of the deficit, rather than stimulating an increase in bank lending to the private sector.

Liquidity not translating into more business loans

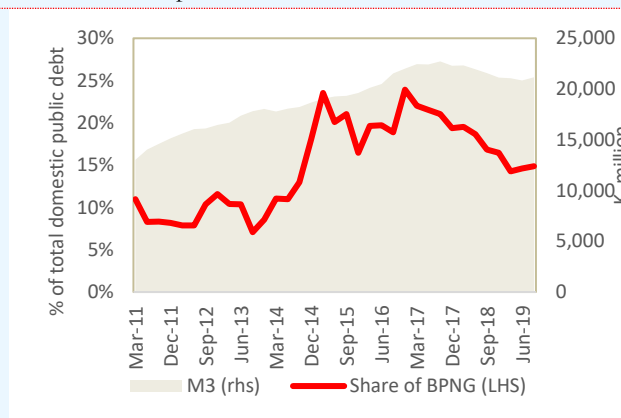
Percent growth, year on year



Source: Bank of Papua New Guinea

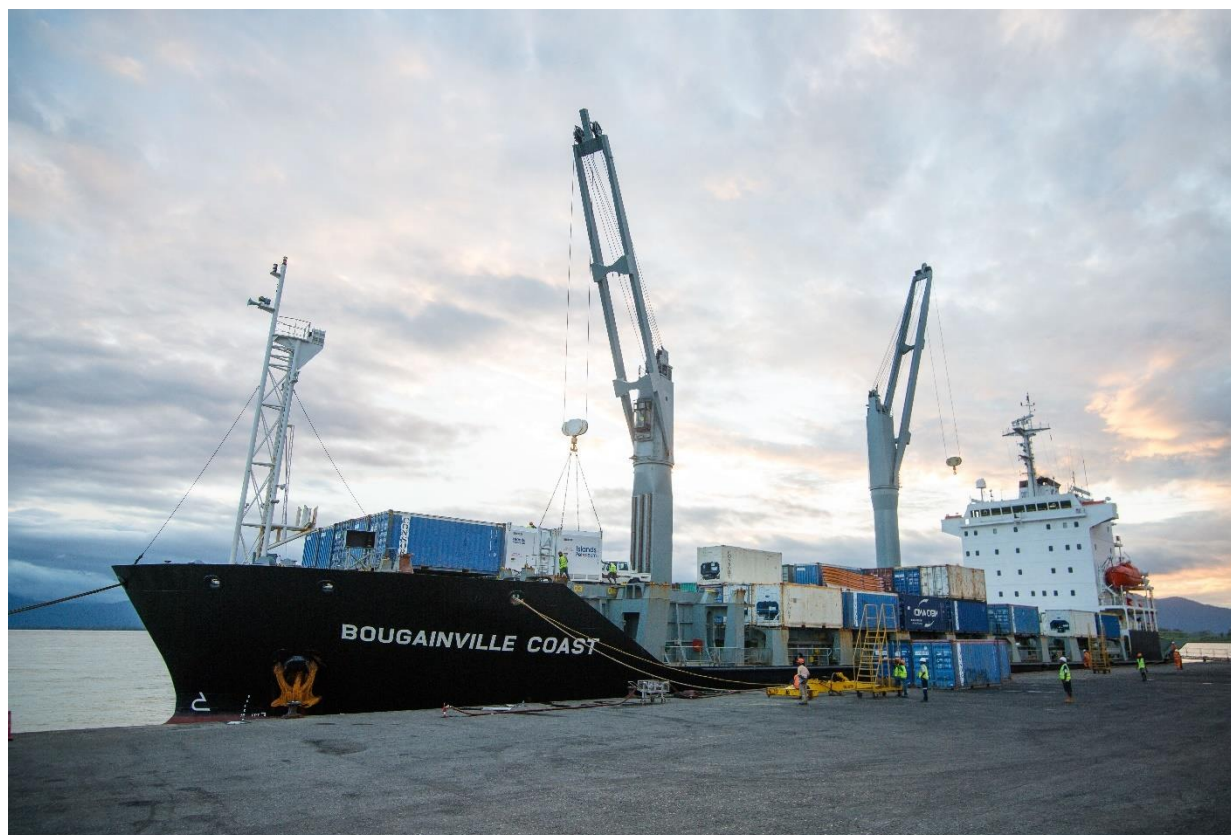
BPNG’s share of public debt has risen

Percent of total public debt; PGK, millions



Source: Bank of Papua New Guinea

Direct central bank purchases of government bonds put further pressure on foreign exchange reserves, exacerbates foreign exchange shortages, and raises the risk of inflation. The combination of injecting further liquidity into the economy and improvement in demand (following the easing of the lockdown) could stoke inflationary pressure. If this inflation is not accompanied by economic growth, stagflation could result. Given the recent moderation in price levels, high inflation seems a distant possibility. In addition, low aggregate demand stemming from the economy-wide lockdown is likely to keep inflation in check in the rest of 2020. However, inflationary pressures could rise if demand recovers as a result of the easing of lockdown restrictions. Increasing global energy prices and faster kina depreciation are among other factors that could generate upward price pressures.



Container shipping movement is down by about 20 percent due to COVID-19.
Photo: Steamships Trading Company Limited.

1.4. External sector

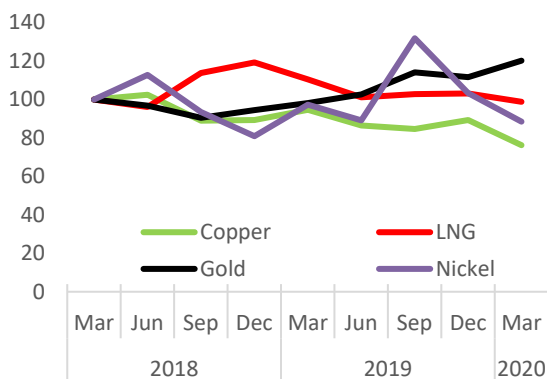
26. **The decline of foreign exchange reserves makes Papua New Guinea's external sector vulnerable, but certain encouraging developments should be noted.** The level of gross international reserves is well below its 2011 peak. At the end of April 2020, reserves stood at US\$2 billion, down from US\$2.3 billion in December 2019. The decline in export receipts is likely to put a strain on foreign exchange reserves. Currently, reserves are sufficient to cover 9.3 months of non-mining import cover and 5.4 months of total import cover. While reserves are not at dangerously low levels, negative dynamics are cause for concern. However, it is worth noting that the production of gold, Papua New Guinea's largest source of export earnings, is booming and is likely to soften the impact of the COVID-19 demand shock. Also, lower energy prices are expected to put downward pressure on import prices.

27. **Persistent current account surpluses have not resulted in reserves accumulation as they have been matched by capital and financial account deficits.** As usual, the current account balance recorded a large surplus in 2019 (23 percent of GDP), underpinned by commodity exports, continuing the pattern since 2014 when LNG exports commenced. The goods balance recorded 14 percent year-on-year growth to December, owing to the strong export performance of the mining and hydrocarbons sector. The former increased by 25 percent annually, while LNG exports grew by 6 percent in 2019. However, reflecting a slowdown in global economic activity due to COVID-19, prices for major commodity exports (excluding gold) have recorded declines since the beginning of 2020 (Figure 10).

28. **Agriculture exports declined by almost 20 percent in 2019, reflecting reductions in export volume reductions and price moderations (Figure 11).** Except for copra oil, volumes of all major agriculture

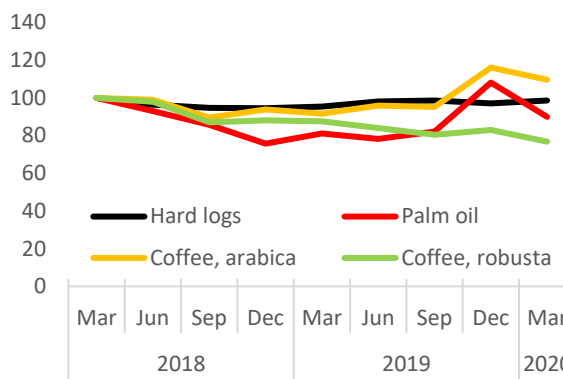
exports recorded sharp declines. On the price side, the price of palm oil dropped from US\$810 per metric ton to US\$609 since the beginning of the year. Coffee prices also recorded a decline, while log prices remained relatively flat.

Figure 10. Prices of major commodities, exported by PNG, have declined, except for gold
(Index, March 2018=100)



Source: Commodity Market Outlook.

Figure 11. Lower export volume and prices led to a moderation in agriculture exports revenue
(Index, March 2018=100)

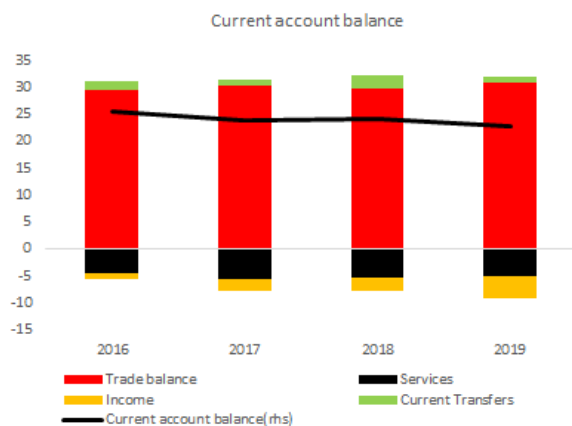


Source: World Bank staff estimates.

29. Nevertheless, the trade balance recorded a strong surplus of US\$7.7 billion in 2019, US\$700 million higher than in 2018 (Figure 12). This surplus in merchandise trade was partially offset by the deficit in service payments (US\$1.3 billion) and net income (US\$1 billion). The latter was largely driven by interest and dividend payments from extractive sector projects.

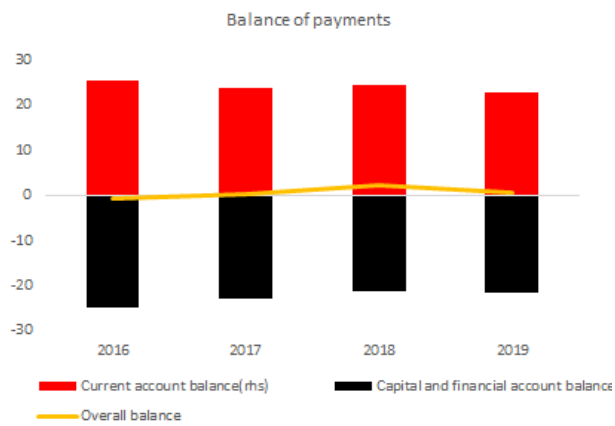
30. The capital and financial account deficit reached US\$5.4 billion in 2019, an increase of US\$500 million compared to 2018 (Figure 13). Financial outflows have been a salient feature of the country’s external sector since the LNG production phase. Earnings from this project are used to pay down outstanding debt incurred in the financing of the construction phase, largely offsetting the current account surplus. As such, the latter fails to contribute to the accumulation of foreign reserves. Depressed LNG prices and the large outstanding debt suggest that this trend will continue.

Figure 12. The current account balance remained in surplus
(Percent of GDP)



Source: Bank of Papua New Guinea.

Figure 13. The current account surplus was used to pay down debt
(Percent of GDP)



Source: Bank of Papua New Guinea.

31. **The BPNG continues to ration access to foreign exchange to help slow the depletion of foreign currency reserves.** The pace of intervention stood at US\$30 million to US\$60 million per month in early 2020. Although this policy has reduced the backlog of unfilled foreign exchange orders, it remains substantial, with over PGK 1.3 billion in the total order book in April 2020. Consequently, access to foreign exchange remains as one of the major impediments for doing business in Papua New Guinea.⁸ The BPNG expressed its intent to continue active intervention in the foreign exchange market, prioritizing the needs of frontline health services. To this end, as part of the COVID-19 response package, the government secured US\$433 million (PGK 1.5 billion) worth of foreign assistance to help finance immediate import needs. Although the borrowing is highly concessional and helps fill the fiscal gap, it will require careful management to ensure debt sustainability.

32. **The Kina continued to depreciate against the U.S. dollar while appreciating in trade-weighted terms.** Papua New Guinea's de-facto exchange rate is a crawling peg, with the rate of crawl managed by the BPNG, which tries to balance imported inflation against the depletion of foreign currency reserves. Over the past five years, the Kina has depreciated 30 percent against the U.S. dollar. This trend continued in early 2020, although the pace of depreciation slowed. The average monthly depreciation of the Kina to the U.S. dollar was only 0.1 percent in 2019, significantly slower than in 2018 (0.4 percent average monthly depreciation). The Kina's performance against the Australian dollar has been mixed, reflecting underlying U.S. dollar–Australian dollar movements; the kina strengthened from AUD 0.40 in January 2019 to AUD 0.43 in November, before falling back. The 'flight to safety' that coincided with the beginning of the COVID-19 pandemic saw a sharp strengthening of the U.S. dollar, leading the Kina to strengthen further, reaching AUD 0.51 on March 20, before falling back to AUD 0.41 by May 2020.

33. **The overvalued Kina remains a major obstacle to reserve accumulation and export stimulation.** The most recent (pre-COVID-19) external sector assessment by the IMF suggests that the Kina is still overvalued by between 11 to 18 percent (IMF 2020a). A more flexible exchange rate and a faster pace of depreciation are needed to increase the supply of foreign currency, contribute to the accumulation of foreign exchange reserves, and reduce the backlog of import orders. Despite acknowledging the overvaluation of the exchange rate, the authorities resist the idea of faster depreciation, arguing that this could substantially increase imported inflation. However, the desire to keep inflation in check comes at the expense of foreign reserves loss. While foreign currency reserves can be bolstered by ever more foreign borrowing, this comes at the cost of debt interest payments and potential rollover risks when repayment comes due. In addition, overvalued Kina leads to artificially low import prices and discourages exports.

34. **Historically low inflation, the decline in several import prices, and modest levels of foreign currency-denominated public debt create a benign environment for more exchange rate flexibility.** Inflation has remained relatively low over the recent period. With the pandemic-driven drop in demand, inflation is not expected to accelerate any time soon unless there is a significant disruption to domestic or external supply chains. Furthermore, the relative appreciation of the Kina against trading partner currencies has reduced the price of some imported goods. For example, the Kina's 9-percent nominal appreciation against the Australian dollar since the start of 2020 has reduced prices for over half of Papua New Guinea's imports. Lastly, PNG's foreign-denominated debt is mainly concessional and long term, which counters the argument against depreciation on the basis of a surge of foreign debt repayments in domestic currency terms.

⁸ Smirk, Justin. 2020. "The PNG 100 CEO Survey: Papua New Guinea's chief executives 'remain optimistic.'" *Business Advantage PNG*, February 24. <https://www.businessadvantagepng.com/the-png-100-ceo-survey-papua-new-guineas-chief-executives-remain-optimistic/>.



The current crisis is an opportunity for the authorities to prepare the economy for resilient recovery.
Photo: Conor Ashleigh.

2. Outlook and risks

2.1. Global outlook and risks

35. **The COVID-19 outbreak interrupted the signs of incipient global economic recovery observed in early 2020.** The January 2020 Global Economic Prospects projections envisaged global growth edging up to 2.5 percent in 2020 and firming after that, predicated on a gradual recovery of investment and trade and a rebound in several major economies that were gradually emerging from recessions or sharp slowdowns in 2019 (World Bank 2020a). However, the rapid spread of the coronavirus beyond China caused significant disruptions to the global economic outlook. It also triggered sharp revisions to consensus GDP growth forecasts in major economies and in most Emerging Market and Developing Economies (EMDEs), including Papua New Guinea.

36. **The June 2020 Global Economic Prospects revised growth projections for the developing East Asia and Pacific (EAP) region.** Economic growth is now expected to slow further, to 0.5 percent in 2020, while the rest of the world will dive into recession (World Bank 2020e). The EAP economies which are more exposed to the movement of goods, people, and investment will see more severe growth impacts in 2020 than smaller economies, like Papua New Guinea, which are less exposed to international tourism and speculative investment (Table 6). Barring new, unexpected shocks and prolonged financial market stress, the deeper the slowdown in 2020, the more rapid the recovery in 2021. Although some EAP economies may see the COVID-19 impacts to spill over to 2021, all EAP economies are expected to see GDP growth rebound in 2021. This reflects low bases of comparison in 2020 due to the COVID-19 pandemic.

Table 6. Real GDP Growth, 2017–21
(Percent)

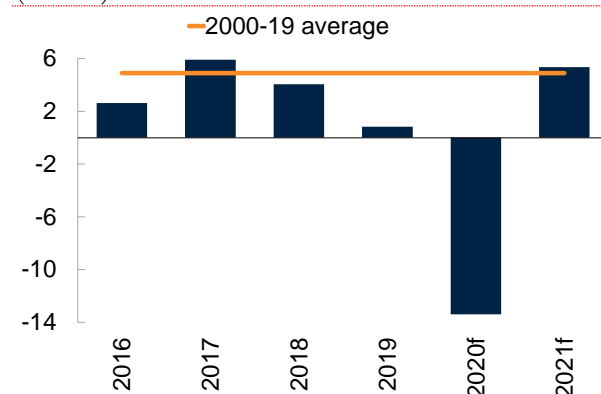
	2017	2018	2019 Est.	2020 projections as of			2021 Jun	Percentage point differences from January 2020 projections	
				Jan	Mar	Jun		2020 Δ change	2021
World	3.3	3.0	2.4	2.5	..	-5.2	4.2	-7.7	1.6
East Asia and Pacific region	5.4	6.3	5.9	5.7	2.1	0.5	6.6	-5.2	1.0
Cambodia	7.0	7.5	7.1	6.8	2.5	-1.0	6.0	-7.8	-0.8
China	6.8	6.6	6.1	5.9	2.3	1.0	6.9	-4.9	1.1
Fiji	5.4	3.5	1.0	1.7	-4.3	-4.3	1.9	-6.0	-1.0
Indonesia	5.1	5.2	5.0	5.1	2.1	0.0	4.8	-5.1	-0.4
Lao PDR	6.9	6.3	4.7	5.8	3.6	1.0	4.6	-4.8	-1.1
Malaysia	5.7	4.7	4.3	4.5	-0.1	-3.1	6.9	-7.6	2.4
Mongolia	5.3	6.9	4.8	5.5	2.4	-0.5	4.9	-6.0	-0.3
Myanmar	6.2	6.8	6.3	6.7	3.0	1.5	6.0	-5.2	-0.8
Papua New Guinea	3.5	-0.8	6.0	2.9	0.2	-1.3	3.4	-4.2	0.5
Philippines	6.9	6.3	6.0	6.1	3.0	-1.9	6.2	-8.0	0.0
Solomon Islands	3.7	3.9	2.7	2.8	-6.7	-6.7	-0.3	-9.5	-3.1
Thailand	4.1	4.2	2.4	2.7	-3.0	-5.0	4.1	-7.7	1.3
Timor-Leste	-3.8	-0.8	3.4	4.6	-2.8	-4.8	3.8	-9.4	-1.1
Vietnam	6.8	7.1	7.0	6.5	4.9	2.8	6.8	-3.7	0.3

Source: World Bank staff estimates and projections.

37. **Global economic conditions are likely to remain challenging over the forecast period.** Global financing conditions will remain complex and volatile. The World Trade Organization forecasts that global trade will decline by 13–32 percent in 2020, likely exceeding the trade slump observed during the 2008–09 global financial crisis (Figure 14). The ongoing COVID-19 pandemic has put additional downward pressure on commodity prices, particularly for energy, which will be further amplified by a surplus of oil supply as OPEC+ members resume full oil production capacity. The recent fall in oil and energy prices also reflects expectations that demand will be weaker than previously envisioned, as the COVID-19 outbreak has already reduced global economic activity as well as air travel and shipping, major sources of oil demand. Other industrial commodity prices have weakened in response to the COVID-19 pandemic. Overall, metal prices are expected to decline in 2020, reflecting subdued industrial commodity demand, particularly from China. Agricultural prices are forecast to stabilize in 2020, after falling in the second half of 2019 due to improved supply conditions (Figure 15).

Figure 14. Global trade is being affected severely by the COVID-19 crisis

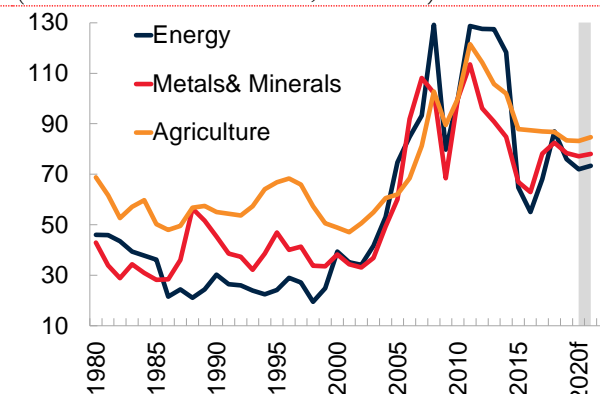
(Percent)



Sources: Haver Analytics; World Trade Organization.

Figure 15. Global commodity prices are hit by the crisis, with energy prices affected most

(Index=nominal U.S. dollars; 2010=100)



Sources: Haver Analytics; World Bank staff estimates.

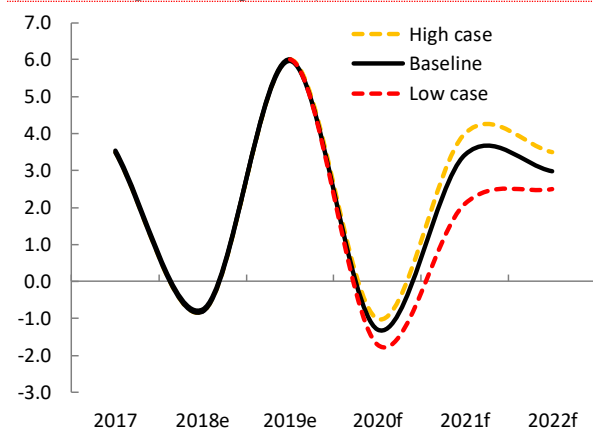
38. **The balance of risks to the outlook is firmly tilted to the downside.** The main risks include the possibility that the COVID-19 pandemic lingers and has a lasting economic impact on the global economy. In addition, despite large policy support packages, financial market turmoil in advanced economies may persist for several months and cause further capital outflows from EMDEs. Tighter financing conditions could further reduce EMDE growth. Developing EAP economies have different vulnerabilities to financial shocks: China, Malaysia, Thailand, and Vietnam, through elevated domestic debt; Cambodia, the Lao People's Democratic Republic, Malaysia, Mongolia, and Papua New Guinea through external debt; and Malaysia and Thailand through a heavy reliance on short-term debt. This could exacerbate existing balance sheet weaknesses in highly leveraged economies and lead to defaults and financial crises in the most vulnerable economies. Global trade could remain depressed for an extended period, causing a disintegration of global and regional value chains. Trade policy uncertainty also continues to represent a risk to the outlook.

2.2. Papua New Guinea's economic outlook and risks

39. **Papua New Guinea's near-term growth outlook is being affected negatively by the pandemic-related movement restrictions in the Pacific region, the exacerbation of the LNG glut globally, and delays in delivering new resource projects in Papua New Guinea.** Our baseline forecast now suggests that real GDP will contract by 1.3 percent in 2020, while a growth rebound of over 3 percent is expected in 2021, assuming a recovery in the world economy from the COVID-19 impacts (Figure 16). A similar pattern is assumed for high-case and low-case scenarios, with different magnitudes for COVID-19 impacts on the resource and non-resource parts of the economy. While the resource sector is being affected by weaker external demand, lower commodity prices, the LNG glut, and delays in the implementation of new resource projects, the non-resource economy is impacted negatively by lower activity in the domestic economy due to the national lockdown which is partly to be offset by the modest economic stimulus package adopted by the government to mitigate the COVID-19 crisis in 2020. Once the crisis is over, the economy should experience a rebound in 2021 (Figure 17), assuming the removal of movement restrictions, firmer external and domestic demand, more favorable terms of trade, and the beginning of the construction phase of new resource projects in the pipeline.⁹

Figure 16. An economic downturn in 2020 will be followed by recovery in 2021–22

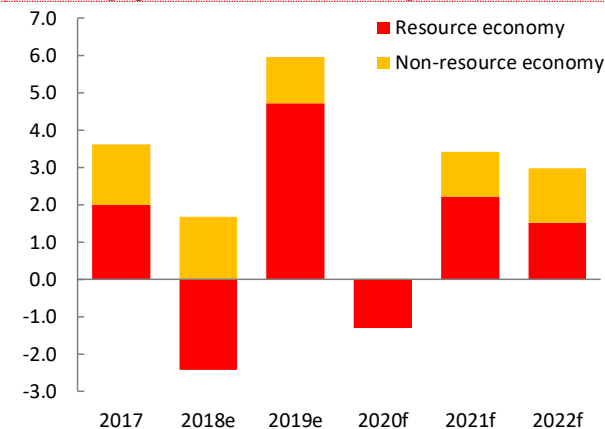
(Real GDP growth in percent)



Source: World Bank staff estimates.

Figure 17. The resource and non-resource parts of the economy are expected to drive the recovery

(Percentage point contribution to real growth)



Source: World Bank staff estimates.

⁹ The upcoming construction boom will be driven by foreign investment into new resource projects, such as the Papua LNG (liquefied natural gas) project, the Wafi-Golpu gold and copper mine, the P'nyang gas field, and the Pasca A gas condensate field. Potential expansions of the existing Porgera gold and silver mine (subject to its license extension) and the Ramu NiCo (nickel and cobalt) mine should also contribute to the upcoming construction boom.

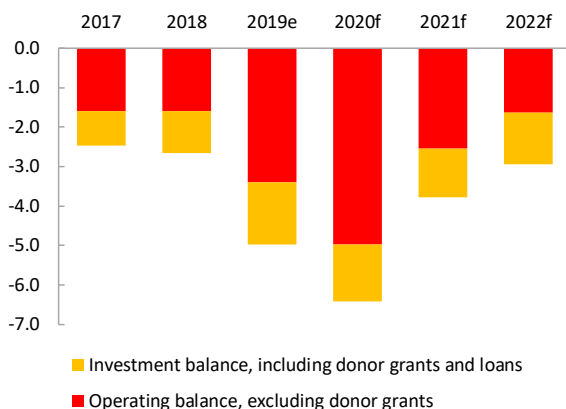
40. **Inflation is expected to stay muted in 2020, although there is a downside risk over the medium term.** The benign inflationary outlook for this year is underpinned by weak domestic demand, the overvalued local currency, and subdued energy prices. Despite recovery toward the end of the second quarter, global energy prices are projected to remain low, reducing imported inflation. The relaxation of COVID-19 mitigation measures is likely to reinvigorate domestic demand, putting upward pressure on prices. However, keeping some containment measures in place (such as restaurants operating at half capacity, limited travel, and so on) and precautionary behavior by consumers will keep inflation in check for the rest of the year. A faster pace of the Kina depreciation, disruption to supply chains, and government debt financing by the BPNG are factors that raise inflationary risks over the medium term.

41. **Underpinned by financial outflows, the external balance is forecast to record a deficit, putting further pressure on international reserves.** The current account is expected to remain in surplus in 2020, but the surplus will be smaller. Prices of major exports—including precious metals, energy, and agricultural commodities—are expected to average lower in 2020; gold being an exception. Global monetary easing and safe-haven flows, which typically occur during periods of heightened uncertainty, have driven gold prices higher. However, prices are expected to drop back as the global recession tapers off. Although external budget financing will provide immediate relief to the foreign exchange market, falling exports and disruptions to mining projects are likely to offset these positive developments in the short term. Ongoing disputes around the Porgera mine may affect investor confidence and, therefore, should be treated carefully.

42. **Reflecting economic uncertainties, the BPNG is expected to continue its accommodative monetary policy over the near term with potential normalization to follow subject to inflationary pressure and economic growth.** However, the BPNG should address structural deficiencies within the financial sector (discussed above) to ensure these policies have the desired impacts. Policies such as reducing excess liquidity, enabling healthy competition, enhancing the effectiveness of money markets, and improving the investment climate in the financial sector should complement the monetary stimulus package.

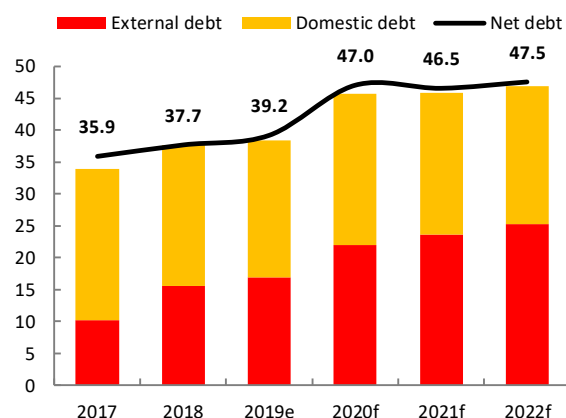
43. **The COVID-19 crisis has impacted the already-complicated fiscal picture and will lead to a higher debt-to-GDP ratio, above the legislated level.** Before COVID-19, the government was planning the fiscal deficit at 5.1 percent of GDP in 2020, which was higher than in the previous years due to substantial budget arrears accumulated by the government. Moreover, the previous underreporting on public and publicly guaranteed debt required an adjustment to the legislated debt ceiling, which was raised from 40 to 45 percent of GDP at the end of 2019. The COVID-19 impacts will lead to a higher fiscal deficit, estimated at 6.4 percent of revised GDP (Figure 18), and a higher debt-to-GDP ratio, estimated at 47 percent of revised GDP in 2020 (Figure 19). To contain public debt from growing further, the government will need to resume its fiscal consolidation efforts in the post-COVID-19 period, by focusing more on mobilizing domestic revenue and improving efficiency in the current budget envelope, in line with the targets in the IMF SMP.

Figure 18. The overall fiscal deficit will peak in 2020, before starting to narrow after
(Percent of GDP)



Sources: Department of Treasury; World Bank staff estimates.

Figure 19. Expansionary fiscal policy and the COVID-19 impacts will push public debt higher
(Percent of GDP)



Sources: Department of Treasury; World Bank staff estimates.

3. Policy options to prepare the economy for recovery

44. **While the immediate focus of the government is on short-term crisis mitigation measures, the current crisis also provides an opportunity to prepare the economy for resilient recovery over the medium term and for similar crises in the future.** The two things are of course closely interlinked: the more effective the short-term crisis mitigation measures, the better the economy will be able to recover over the medium term. For more inclusive and sustainable development over the medium term, the authorities will need to ensure that frontline health services continue to deliver during the crisis. More inclusive and sustainable development over the medium term would also be supported by current action to introduce safety nets for the poor and vulnerable, support firms and jobs in the informal sector, and strengthen the macroeconomic policy framework. Going forward, it will be important to resume the Connect PNG infrastructure development program, to help with filling critical infrastructure gaps that impede the realization of Papua New Guinea's growth potential. The following selected policy areas may require government's interventions to improve the country's ability to recover from this shock and be more resilient to potential external shocks in the future:


- Protecting lives and the health of the population.** Public funding for routine service delivery by Christian and Catholic Health Services has been faltering since the start of the COVID-19 crisis.¹⁰ The release of health function grants to Provincial Health Authorities, which finance vital operational spending for outreach, is also delayed. These funding interruptions are likely to have severe impacts on the coverage and quality of routine health services in a country where much of the rural population depends on outreach for essential services like immunization. Maintaining frontline health services during the crisis is critical both for the COVID-19 response and for safeguarding the health of the population and workforce.
 - **Action:** Prioritize full and timely disbursement of budgeted funds for frontline health service delivery.
- Supporting livelihoods of the poor and vulnerable.** Currently, Papua New Guinea's ability to provide social assistance to the poor and vulnerable is constrained by the unavailability of formal social safety nets, meaning that people rely mostly on existing informal networks. The use of social protection

¹⁰ FM100 News. 2020. "Church run health services facing closure in PNG." FM100 News online edition, June 23. Available at <https://kalangfm.com/news/church-run-health-services-facing-closure-in-png-771>.

programs to provide relief to households has been a common response to COVID-19 globally. In Papua New Guinea, the limited social protection infrastructure in place presents a challenge to any immediate relief response. Going forward, developing such an infrastructure would be important for supporting the poor and vulnerable during crises. Across developing economies, supply-side interventions on health services have been combined with social assistance and social insurance schemes, with cash transfer programs, paid sick leave, and unemployment benefits are widely used. Labor market interventions continue to be an important area of action, especially in the form of wage subsidies. Public works has been another common response to COVID-19, though risk of infection presents some challenges to its use during the relief phase. An alternative to cash payments is provision of in-kind support. However, it requires logistics planning, including supply chain assessments, and involves transport costs, storage arrangements, distributions kits, distributions centers etc. In short, it is more complex and costly than cash transfers, and is harder to implement.

- **Action:** Introduce a targeted social assistance program by picking up one or two intervention areas of support to the poor and vulnerable.
- **Supporting firms and jobs.** The impact of COVID-19 on businesses is occurring through four distinct channels: (1) a decline in demand for goods and services due to travel restrictions and shutdown measures; (2) reduced supply as firms are hampered by worker absences, productivity declines, and the disruption of global supply chains; (3) tightening of credit conditions and a liquidity crunch; (4) and a fall in investment due to uncertainty. Governments around the world have put in place a number of measures to support and protect firms and jobs, mostly targeted at MSMEs. The government of Papua New Guinea has already provided tax relief and started supporting MSMEs through the formal banking channel to keep otherwise viable firms from slipping into informality or bankruptcy and improving the prospects of a speedy recovery. Where social protection systems are less developed, such as in Papua New Guinea, support to informal firms may be an alternative way to reach workers. This could include:
 - **Action:** Facilitate access to working capital through remittances and community-based financial institutions; leverage mobile and digital payments technology.
- **Ensuring macroeconomic stability.** Economic growth in Papua New Guinea is characterized by boom and bust cycles, driven by developments in the natural resource sector. These cycles also adversely impact fiscal and public expenditure management, as expenditure goes up during booms (often in the form of projects with questionable effectiveness), giving rise to macroeconomic problems when the boom ends. Once the COVID-19 impacts have passed, the key challenge is to complete the macro-fiscal adjustment and to continue implementing economic reforms to mitigate the macroeconomic impacts of volatility in the resource sector, including making the use of the sovereign wealth fund.
 - **Action:** In the post-COVID-19 period, implement counter-cyclical fiscal policy and strengthen debt management capacity.
- **Improving the quality of physical infrastructure for sustainable development.** In late 2019 the government introduced a new program, Connect PNG, to improve the country's road, port, and telecommunication connectivity. However, the government's pre-COVID-19 infrastructure investment plans have been amended amid the current crisis. A COVID-19-related revenue shortfall and increased spending for the health emergency and economic support package have created an unanticipated fiscal gap of over US\$400 million (1.8 percent of GDP) in 2020. The government will have to trim non-essential spending, and the capital budget is expected to be hit harder than the recurrent budget.

- Action: Resume the Connect PNG program once the pandemic is over while keeping the overall fiscal framework under control. The special focus section of this report investigates constraints and opportunities for physical infrastructure development in Papua New Guinea.



Part B

Special focus

Investing in Physical
Infrastructure for
Sustainable Development



While Papua New Guinea has made progress in improving access to clean water and sanitation facilities, there is still much work to be done. Photo: UNICEF PNG/2018/Chambers.

1. Papua New Guinea infrastructure section overview

1.1. Infrastructure, growth, and poverty reduction

45. **When countries work to reduce poverty and enhance growth sustainably, one of the most important areas for their attention is infrastructure.** In the absence of safe water and sanitation, the incidence of waterborne diseases (diarrhea, typhoid, cholera) and malnutrition rises, and poor public health leads to low labor productivity, forgone education and employment opportunity, and added health-related expenses for households—all of which affects poverty levels and limits sustainable development. Low levels of access to electricity limit children’s ability to study, limit the activities of schools and health services, exacerbate personal security problems, and hinder economic activities. Without roads, airports, and ports, people are not able to access schools, health services, markets and other economic opportunities, or international and regional exchanges: poor connectivity drives up costs for service delivery, especially for businesses and the private sector, and generally fosters poverty. Without information and communication technology (ICT), people’s access to information and their connections with each other and the rest of the world are limited.

46. **By focusing on building and maintaining appropriate infrastructure, governments take an important step toward better living standards for citizens and greater, more sustainable economic growth.** This section assesses Papua New Guinea’s infrastructure in four areas—energy, transport, water and sanitation, and ICT—summarizing the status, coverage, cost, and quality of the infrastructure and considering obstacles to and opportunities for improving the situation. Recognizing that growth in incomes and population in Papua New Guinea will substantially boost demand for infrastructure in the coming years, it provides a set

of concrete recommendations in each area that can help Papua New Guinea and its development partners meet that demand.

1.2. Energy sector

a. Context

47. **The source and level of energy used vary across Papua New Guinea.** Residential, commercial, and industrial consumers in urban centers use energy supplied by the state-owned energy utility company, PNG Power Limited (PPL), generated from hydropower and diesel generation plants. They also supply wholesale power purchased from independent power producers (IPPs) that use natural gas, heavy fuel oil, and hydropower. In rural areas, communities and villages rely on traditional biomass, solar home systems and torches for lighting, small diesel and petrol generation, and mini-hydropower plants. Enclave extractive industries (mining and hydrocarbon) own and operate hydropower plants, diesel stations, geothermal plants, and natural gas power plants. The main hydrocarbon operators liquefy the natural gas and export the LNG to overseas clients, while condensates are extracted and sold in the open market.

48. **Household energy demand¹¹ varies** from 25 Kilowatt hour (kWh) per month (300 kWh per year) to a medium-high level of 200 kWh per month (~2,500 kWh per year) (Table 7).

Table 7. Household Energy Demand

	Rural		Urban	
	Annual demand (kWh per year)	Share of total households (%)	Annual demand (kWh per year)	Share of total households (%)
Poor	300	39	1,000	41
Rich	1000	61	2,500	59
Average	728		1,878	

Source: PPL billing data, 2015; WB poverty analysis, 2004; and national census, 2010/2011.

Note: CU/ECA showed percentages by “poor” and “rich” homes. This was not meant to indicate that households in Papua New Guinea fall into only two distinct groups, but rather to indicate the range of household demand.

49. **Papua New Guinea has an abundance of natural energy resources—hydropower, natural gas, and solar—but they are underutilized.** For example, its estimated hydropower technical potential exceeds 15,000 MW (IHA, 2018), but less than 250 MW has been harnessed. And, while LNG export accounts for approximately 18 percent of GDP, the country imports fossil fuels for electricity generation. (However, the use of natural gas for power generation is beginning to increase with the recent commissioning of gas-fired thermal plants.).

50. **The institutional setup of the country’s power sector is evolving.** The government has established key ministries and an independent regulator to administer the power sector. Since November 2019, the power sector is the responsibility of the Ministry for Petroleum and Energy through its Energy Division. The Ministry for Public Enterprises and State Investment manages Kumul Consolidated Holdings Limited (KCH), which holds the shares for corporatized SOEs as trustee of the General Business Trust. As the sole shareholder, KCH is responsible for the oversight of all SOEs, including PPL, which is licensed to generate, transmit, distribute, and sell electricity throughout the country with the exclusive right to supply small customers (with a load of less than 10 MW) in 10 km of its network.¹² The Independent Consumer and Competition Commission (ICCC) is the principal regulator and consumer watchdog body in Papua New Guinea; in the power sector, the ICCC regulates licensing, industrial codes, tariffs, and service standards and monitors competition. By agreement with

¹¹ Columbia University, Sustainable Engineering Lab, and Economic Consulting Associates (2017) includes a review of PPL billing data gathered from the Port Moresby headquarters and PPL field offices in Kokopo and Madang.

¹² KCH was established to plan, develop, generate, transmit, distribute, and sell electricity throughout Papua New Guinea.

the ICCO, PPL develops technical regulations, such as construction and service standards. There are ongoing discussions about possible further institutional reforms, such as establishing a National Energy Authority in charge of regulatory functions for the power sector.

51. **Stark gender gaps exist in the energy sector.** Women are significantly under-represented in management and technical roles in PPL, where they represent 11 and 4 percent of staff, respectively.¹³ PPL is aligning with the Pacific Power Association's effort to increase the employment of women by member utilities and to make the workplace more attractive, accessible, and welcoming to talented candidates, regardless of gender or background.¹⁴ Furthermore, addressing the gender imbalance at PPL is an effective strategy for improving its performance, as recent research shows that a more gender-balanced team is associated with productivity gains (Desvaux et al. 2016).

b. Access to infrastructure and affordability

52. **PPL's electricity network has limited capacity and reach.** Papua New Guinea has about 580 MW of installed generation capacity, comprising hydropower (230 MW, 39.7 percent), diesel (217 MW, 37.4 percent), gas-fired (82 MW, 14.1 percent), and geothermal (53 MW, 9.1 percent). PPL manages about 300 MW of capacity, while IPPs manage 280 MW. The portion managed by PPL includes three main grids located in and around Port Moresby, Lae-Madang-Highlands area (the Ramu grid), and East New Britain (the Gazelle grid), as well as 26 smaller urban centers that are serviced through isolated power systems clustered around regional population centers.

53. **Access to services is low.** Roughly 13 percent of the population has access to on-grid electricity, and 25 percent to off-grid electricity. There is a 60-percent market penetration of off-grid solar lighting products—among the highest in the world. However, these electrification rates are low in comparison to Southeast Asian economies. High transport costs and lack of consumer finance solutions present a challenge to the wider-scale deployment of off-grid solar products. The prevalence of low-quality products hampers consumer satisfaction. Despite the low access, the economic slowdown from the COVID-19 pandemic is adversely affecting revenues and demand, denying PPL the ability to capitalize on low diesel prices and reduced tariff payments to IPPs (Exxon and Niu Power) that use natural gas.

54. **The cost of service delivery is high.** The average retail tariffs for customers (US\$0.30/kWh) reflect the high investment costs of generation and transmission, as well as operations and maintenance costs, which are significantly higher than in other countries. This poses a challenge for doing business, as it raises the cost of business activities; indeed, Papua New Guinea was ranked 120 of 190 economies in *Doing Business 2020*. The high cost of service is compounded by weak enforcement of sector planning and governance arrangements. PPL has entered into power purchase agreements with a number of IPPs to supply the PPL grids. Investment decisions have been ad hoc and not necessarily based on long-term, least-cost planning, and investment projects are often selected from unsolicited proposals. Because of the unreliability of the on-grid power supply and the high cost of electricity supplied by PPL, consumers resort to expensive and inefficient self-generation and back-up generation capacity. It will be important to improve PPL's operational and financial performance, implement least-cost power development investments, and select investments on a competitive basis to reduce the cost of service.

¹³ In total, 17 percent of all PPL staff are women.

¹⁴ See the PPA gender portal at <https://www.ppa.org.fj/gender-portal/>.

c. Quality of services

55. **The power supply is generally unreliable.** Firms in Papua New Guinea experience approximately 42 power outages in a typical month, compared to 5 and 9 outages per month, respectively, in EAP and lower-middle-income economies. Roughly 87 percent of firms own or share a generator, more than twice the average for lower-middle-income (36 percent) and EAP economies (33 percent).¹⁵ Papua New Guinea also performs poorly on the reliability of supply and transparency of tariffs; in this area *Doing Business 2020* ranks Papua New Guinea 0 out of 8 countries.¹⁶ The low reliability of electricity supply is attributable to the inadequate maintenance of electricity generation, transmission, and distribution assets.¹⁷ Insufficient internal capability and low industry skills and experience have led to shortcomings in generation, transmission, and distribution assets and system operations, with high system losses, and to poor financial performance arising from a lack of proper investment planning and poor revenue management, including low electricity bill collections. PPL's cash-flow challenges at times compel the company to reduce fuel purchases, limit power generation, and thereby shed load.

d. Financing and investment gap

56. **Significant financial resources will be required to attain the government's electrification targets and to meet the growing demand for electricity.** An investment of roughly US\$130 million annually will be needed to electrify 70 percent of the population by 2030 (World Bank estimate).

57. **PPL is in financial distress.** PPL's financial sustainability is crucial for improving its services, catalyzing private investments, and expanding the power system. The company has yet to complete its financial statements for FY17-18. It suffers from weak organizational capabilities—rules and guidelines for treasury functions have not been adopted or routine processes established, and staff are undertrained. A utility's financial sustainability depends partly on controlling the cost of services and the adequacy of electricity tariffs, and partly on permanent billing (sales) and collection of billed amounts. PPL sold and billed for less than 77 percent of energy supplied into its networks in FY17, suggesting total losses of more than 23 percent due to low billing rates and issues related to the collection of bills. Effectiveness in billing and collection is under the company's control and must be addressed as a matter of urgency.¹⁸ PPL's operational and financial viability are key to establishing itself as a credible off-taker for power purchase agreements to enable private investments in new generation projects under the IPP scheme.

58. **Public finance alone cannot meet the magnitude of investment needed.** The government's annual fiscal allocation for the energy sector is small. For example, the capital budget allocated for rural electrification in the 2020 budget was just over US\$2 million (about PGK 7 million). Development partners' total aid commitment in the energy sector amounts to US\$445 million,¹⁹ falling short of the investment needs. Improving PPL's balance sheet, and thereby facilitating private investment in power infrastructure is a key priority.

¹⁵ See World Bank Enterprise Surveys at <https://www.enterprisesurveys.org/en/data>. Data cited are for 2015.

¹⁶ See the *Doing Business 2020* economy profile for Papua New Guinea, available from <https://www.doingbusiness.org/content/dam/doingBusiness/country/p/papua-new-guinea/PNG.pdf>.

¹⁷ See Neto et al. (2019) and Lawrence (2017).

¹⁸ Although uncollected bills are not a permanent financial loss, poor collection rates affect the utility's financial performance. The current collection rate of bills issued by PPL to government agencies, representing 14 percent of the company's sales, is very low. In 2017, the amounts of unpaid receivables from those agencies, which are handled by PPL as non-disconnectable points of supply, reached US\$18.7 million—a figure that is growing at a rate above PGK 10 million per month. This issue should be addressed at the broader government level as a matter of urgency.

¹⁹ See the Lowy Institute's Pacific Aid Map (<https://pacificaidmap.lowyinstitute.org/>); accessed June 10, 2020.

1.3. Transport sector

a. Context

59. **Papua New Guinea’s transportation infrastructure network consists of road, airport, and port and waterway infrastructure.** The total road network is approximately 29,700 km long, and the national road network comprises 8,738 km, of which about 39 percent (3,393 km) is sealed, and 61 percent (5,345 km) is unsealed. The Department of Works and Implementation (DoW) manages the national road network, and provincial and local governments manage provincial and rural roads. Only one provincial capital on the mainland—Kerema, the capital of Gulf Province—is connected to Port Moresby by road. Therefore, aviation and maritime transport modes are critical to link the 22 provincial centers to the capital. The 22 airports in Papua New Guinea’s 22 provinces are owned and operated by the National Airports Corporation (NAC), a commercially oriented SOE that exists under a trustee shareholding of the Minister for Civil Aviation and the Minister for Finance. In addition, 90 rural airstrips are maintained by the Rural Airstrips Authority (RAA), a not-for-profit organization established in 2014 through Mission Aviation Fellowship, a nongovernmental organization (NGO).²⁰ The PNG Ports Corporation Limited (PNGPCL), also an SOE,²¹ owns 16 ports, some of which are operated through concession agreements. An estimated 11 more ports are owned and operated by mining, construction, shipping, forestry, and other private companies.

b. Access to infrastructure and affordability

60. **A major constraint to inclusive growth in Papua New Guinea is the lack of dependable transport infrastructure and efficient transport services.** The transport sector is relevant to nearly all development challenges in the country, but particularly to access to markets, a critical determinant of household-level income. Rural communities that produce the main agricultural exports—coffee, cocoa, and copra, which are estimated to contribute about 6 percent of total export earnings—are widely dispersed and have poor or no connections to markets and basic services. On the World Bank’s Logistics Performance Index for 2018, Papua New Guinea ranks 148 of 160 countries on the quality of trade- and transport-related infrastructure. Transport costs up to 30 percent of revenue for most producers, and delays cause post-harvest losses of between 5 and 25 percent (World Bank 2019b). Businesses identified the state of transport infrastructure as the third most significant constraint on business activity and investment, marginally lower than law and order issues.

61. **The country’s road network comprises 8,738 km of national roads and up to 21,000 km (estimates vary) of subnational roads that are the responsibility of provincial administrations.** The 8,738 km of national roads (Figure 20) is made up of 12 separate networks; interconnecting these networks will be a costly undertaking,²² but it continues to be a long-term national development objective. Only 8,070 km of subnational roads are accounted for in the national road asset management database; of these, 10 percent (807 km) are sealed, and 90 percent (7,263 km) unsealed (PNG, DoW 2017).

62. **Road density in Papua New Guinea is low compared to other countries in the region.** Papua New Guinea’s estimated road density (that is, km per 100 km²) is 6.4, while Fiji and Vanuatu have road densities of 49.3 and 43.3, respectively. Their comparatively smaller land area can explain the higher road density in

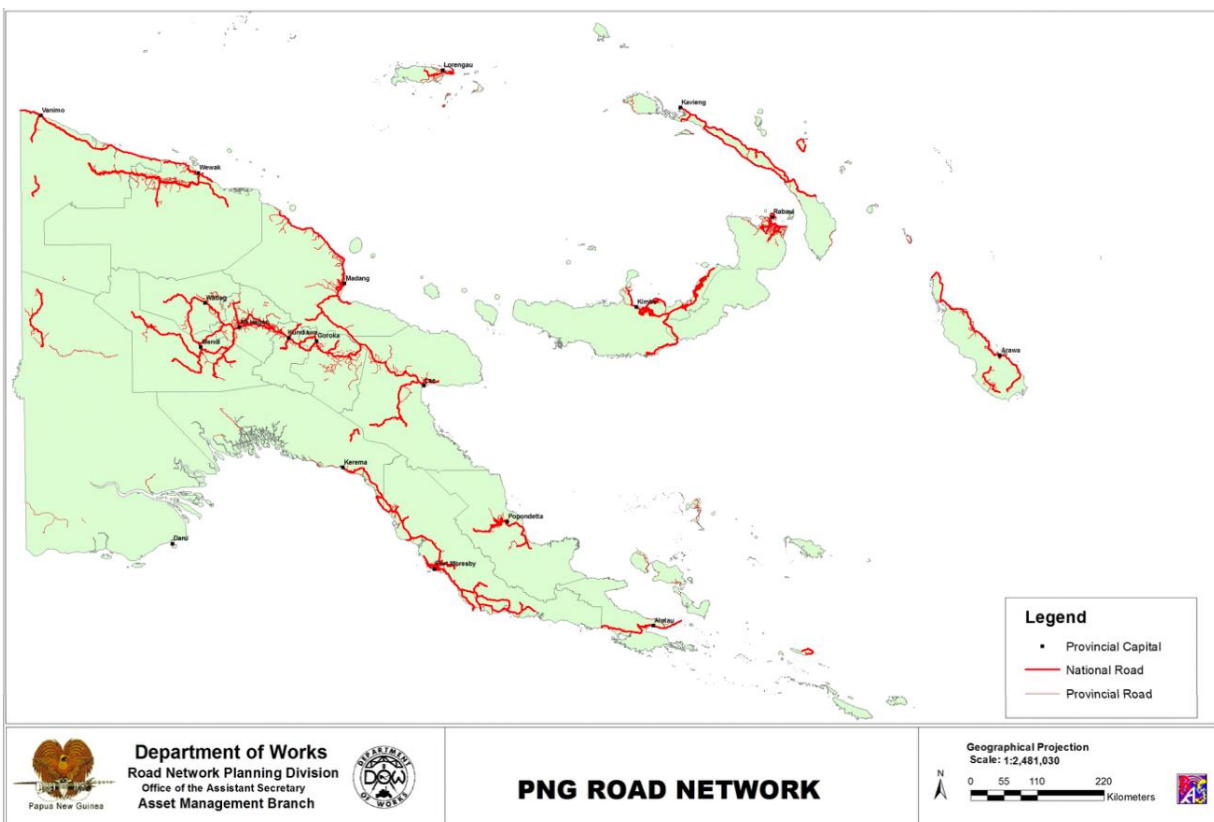
²⁰ RAA is governed by its Board with representation from the Minister of Civil Aviation, provincial governments, local commercial aircraft operators, rural airstrip communities, and Transparency International.

²¹ PNGPCL is held by the government’s holding company for non-petroleum and non-mining assets, Kumul Consolidated Holdings.

²² No specific studies have been carried out to estimate the total cost, the government’s Connect PNG program, which is discussed in later sections, includes a 20-year vision.

Pacific small island countries, but it also highlights the comparatively greater challenges facing Papua New Guinea than its Pacific neighbors in providing access to critical infrastructure.

Figure 20. Papua New Guinea's Road Network



Source: Department of Works.

63. **Road construction and maintenance costs have risen steadily in Papua New Guinea.** The average contract amount for long-term performance-based maintenance of newly sealed roads increased from PGK 25,000/km/year in 2015 to PGK 56,000/km/year in 2017. The average cost of repairing, rehabilitating, improving, and resealing comparable sealed roads in poor condition ranged from PGK 1.2 million²³ to PGK 3 million per km.²⁴ These costs are comparable to those in other countries in the region; road rehabilitation costs are estimated at about PGK 3 million per km in the Solomon Islands, and up to PGK 4.25 million per km in Fiji. Although historical data are scarce, empirical data suggest that prices have risen by more than 5 percent per year since 2015, in line with the growth in the average consumer price index. Moreover, damage to the road network from overloaded vehicles appears to be unmonitored; the country has few weighbridges, and its regulation of heavy vehicles is weak.²⁵

64. **Although road transport is a dominant mode—a high proportion of passengers and freight move by road—about 35 percent of the population lives more than 10 km from a national road, and 17**

²³ Based on data from the Boluminski Highway improvement project in New Ireland, financed by AusAid in 2016.

²⁴ Based on comparisons between contract prices for the World Bank-financed Hiritano Highway and ADB-financed Highlands Region Road Improvement Investment Program Tranche 3.

²⁵ The National. 2018. "Talks on effects of overloading." *The National*, April 5. <https://www.thenational.com.pg/talks-effects-overloading/>.

percent have no road access at all.²⁶ Thus aviation and shipping are crucial transport modes to provide access to remote communities, for those who can afford their costs, and coastal and inland ports and shipping services are essential for economic development. However, fewer data are available about the status of the infrastructure and about the standards recommended by the government. At the time this study was carried out, it was difficult to measure the gap of infrastructure needs for rural maritime and aviation infrastructure. For both transport modes, the main concerns are the safety and security of all stakeholders—ships and aircraft operators, ports and airport managers/operators, and ports and airports users.

65. **Aviation infrastructure and services.** There are huge discrepancies between the conditions and management of airports managed by NAC (22 airports), an SOE, and those operated by RAA, a government statutory body (90 airstrips). Even if their overall condition has deteriorated over time, and they are beginning to pose threats to safety,²⁷ NAC airports are still in a more desirable situation. The international airport, Port Moresby's Jacksons International Airport (JIA), is the hub for the two locally-owned airlines that are being merged currently. With financing from development partners, particularly the Civil Aviation Development Investment Program (CADIP) financed by the Asian Development Bank (ADB), NAC has strengthened and lengthened runways, built new or expanded terminals and enhanced security at about 16 airports, improved air traffic safety, and built institutional capacity. The government is currently seeking a private partner to develop and operate Port Moresby airport. By mid-2019, the improvements through CADIP had enabled local airlines to offer scheduled air services from Port Moresby to 22 destinations, some with multiple daily flights. Both scheduled carriers serve some routes. A few other companies offer private unscheduled services to these and other destinations. For rural airstrips, the situation is worse. They are generally unpaved and lack the funds for maintenance and rehabilitation, as is explained among the constraints in the relevant sections below.

66. **Safe and secure airport infrastructure promotes air traffic development.** Regarding airport infrastructure, JIA, the country's international gateway, has an acceptable safety and security level based on international standards.²⁸ However, less information is available regarding the status of Papua New Guinea's other airports. As passenger and cargo volumes increase, the sector can expect to achieve greater economies of scale. Competition among air carriers would also contribute to better service quality (including scheduling, on-the-ground services, and fares), but this may not be on the government's agenda post-COVID-19.

67. **High costs remain relevant to air passenger travel and cargo.** International air traffic serving Port Moresby's International Airport is costly; unit costs (per passenger, per nautical mile) on flights to Australia are the most expensive in the Pacific.²⁹ Air Niugini's unit cost on Asian routes is more than 2.5 times that of inter-Asian flights.³⁰ Domestic movements in Papua New Guinea have increased: total aircraft movements at domestic airports increased by 3.9 percent per year from 2005 to 2013, and aircraft movement is growing annually by about 3–4 percent (ADB 2017). For 2008–13, except for Port Moresby airport, all other project airports showed traffic growth rates of above 5 percent. Despite these traffic increases, air travel is still an expensive luxury for the majority of the population.

68. **Communities without access to road and air travel rely on riverine and littoral maritime transport.** Papua New Guinea's maritime and waterway infrastructure is mostly rudimentary and dangerous for passengers and cargo transportation and docking. It is uncertain whether minimum standards have been

²⁶ See the Papua New Guinea Road Assessment at <https://dlca.logcluster.org/display/public/DLCA/2.3+Papua+New+Guinea+Road+Assessment>.

²⁷ Lawrence, Craig. 2017. "Infrastructure Challenges for Papua New Guinea." Lowy Institute. December 6. <https://interactives.lowyinstitute.org/archive/png-in-2017/png-in-2017-infrastructure-challenges-for-papua-new-guineas-future.html#seven>.

²⁸ This assessment is based on the country's Effective Implementation score presented for the various categories covered under the International Civil Aviation Organization (ICAO)'s Universal Safety Oversight Audit Programme (USOAP), 2018.

²⁹ Papua New Guinea Road Assessment, op. cit.

³⁰ Ibid.

established for safety protection purposes, and, if so, whether they are enforced. According to the National Transport Strategy (NTS), there are many small and minor ports in various states of condition and use under provincial, local-level government, and local community ownership (PNG, DoTI 2013). However, there is limited capacity in the provinces to maintain these smaller facilities, so many have fallen into disrepair. The NTS recommends that the best technically equipped agency manage the upkeep of infrastructure assets for provinces and communities with limited managerial capacity and technical capability. For rural ports, PNG Ports Corporation should be engaged to asset manage the facilities on behalf of the owners on a fee-for-service basis.

c. Quality of services

69. **A significant proportion of the national road network is in poor condition, and road condition surveys are carried out irregularly or inconsistently.** The most recent and reliable analysis, a visual condition survey done in 2014, estimated that 13 percent of the national road network was in good condition, 7 percent in fair condition, 21 percent in poor condition, and 59 percent in very poor condition.³¹ Extrapolating from current maintenance programs, in 2018 it was projected that only 8 percent of the national road network would be in good condition and 7 percent in fair condition, while 84 percent would be in poor or very poor condition. More than 75 percent of national, provincial, and district roads become impassable during the year. About 80 percent of the country's bridges are structurally deficient; most were constructed up to 60 years ago, and they have not been well maintained.³² Major roads, including the crucially important Highlands Highway, have deteriorated alarmingly. Almost half of national roads and two-thirds of provincial roads need rehabilitation or reconstruction before they can be properly maintained (Dornan 2016).

70. **Road safety continues to be a concern for the provision of safe land transport services.** Annual traffic crash data show an increasing trend, with incidents rising by about 40 percent between 2002 and 2014 to reach nearly 3,750 crashes. Over the same period, vehicle registrations also increased by about 20 percent, to roughly 87,500 (Road Traffic Authority 2019). Despite the poor condition of roads, the challenging terrain, and the poor road geometry, only 17 percent of road fatalities were due to vehicle rollovers. Road crashes have also been attributed to missing or damaged road signs or road safety engineering measures such as guard rails, newly improved roads, or a lack of adequate lighting. Over 60 percent of road crash fatalities were passengers riding in the back of open trucks, and pedestrians who walk along highway pavements as there are no sidewalks. These numbers reflect the low supply of formal public transport services and a lack of safety awareness among passengers and road users.

71. **Approximately 60 percent of Papua New Guinea's population resides on 6,500 km of coastline and waterways,**³³ **many without access to roads.** Water transport predominates in these areas, especially on smaller islands. Innumerable small wharves, jetties, and beach landings provide the basic infrastructure for maritime services, but most of them are in poor condition and carry very little traffic. The state-owned PNGPCL operates 16 ports, and private corporations operate at least five others. Lae Port handles almost half of the country's maritime freight.

³¹ Visual Road Condition Survey, 2014.

³² Elapa, Jeffrey. 2019. "About 80 percent of bridges are considered old and dangerous." *The National*. March 1. <https://www.thenational.com.pg/about-80pc-of-bridges-seen-as-too-old-and-dangerous>.

³³ Papua New Guinea Port Assessment, op. cit.

d. Infrastructure financing and investment gap

72. **Transport infrastructure financing comes from both internal and external financing sources.** Internal financing includes appropriations from the consolidated budget, as well as self-generated revenues from transport organizations, including statutory authorities—the National Maritime Safety Authority (NMSA); the Road Traffic Authority (RTA), the Civil Aviation Safety Authority (CASA), and commercially-oriented SOEs (such as Motor Vehicles Insurance Limited, PNGPCL, PNG Air Services Limited, and NAC). General taxation, through the Internal Revenue Commission, also generates revenue for internal financing. External financing generally consists of public-private partnerships (PPPs), leveraging private sector financing to deliver essential services in the transport sector, and grants and loans from development partners. However, better governance is necessary to follow up on the repartition and use of collected charges. For example, despite an increase in road user charges from PGK 0.13 to PGK 0.23 per liter, the National Roads Authority receives only PGK 0.04 per liter for maintenance, while the Department of Treasury absorbs the balance of PGK 0.19 per liter (by contrast, in India the diesel excise is currently 23 cents). Further study may be required to develop the optimal financing scheme.

i. Road, maritime and aviation subsectors issues

73. **The Medium-Term Development Plan III (MTDP3)³⁴ and the Medium-Term Transport Plan 2 (MTTP2)³⁵ identify Papua New Guinea’s infrastructure needs in the transport sector** and provide (somewhat differing) estimates of transport sector funding requirements over 2018–22 (Table 8). The MTDP3 identifies the priority economic corridors and prioritizes the expansion of the road network under the National Road Network Strategy adopted in 2018. The MTDP3 forecasts a reduction in government funding and an increase in development partner funding, particularly loans across all sectors. With increasing development partner loans and substantial debt accumulating to transport entities, Papua New Guinea needs to ensure that its funding commitments are aligned with projected revenue growth and its forecast asset base, so that it is able to service its debt obligations.

Table 8. MTDP3 and MTTP2 Estimated Funding Needs for Transport Sector, 2019–22
(PGK billion)

Subsector	MTDP3	MTTP2
Land transport	3.382	2.428
Maritime transport	0.335	0.675
Aviation	0.727	0.561
Total	4.444	3.664

Source: DOTI 2019, *Transport Sector Funding Strategy*.

Note: The figures simply highlight funding needs; they are not government funding commitments based on a prioritized list of projects.

74. **According to the MTTP2, the transport sector has historically received funding below the value of total projects submitted for funding each year through the budget process.** As a result, the gap between funding requirements and project funding is widening. The MTTP2 provides an extensive list of prioritized projects, which is beyond the government’s funding capacity. Priority projects identified by sector agencies are submitted to the sector consolidation team for prioritization and then sent to the central agencies,

³⁴ PNG, DNPM 2017.

³⁵ PNG, DOTI 2018.

including the Department of Treasury and the Department of National Planning and Monitoring. The list of projects is prioritized again by the central agencies so that the available financial resources are allocated to finance projects that yield higher national benefits.

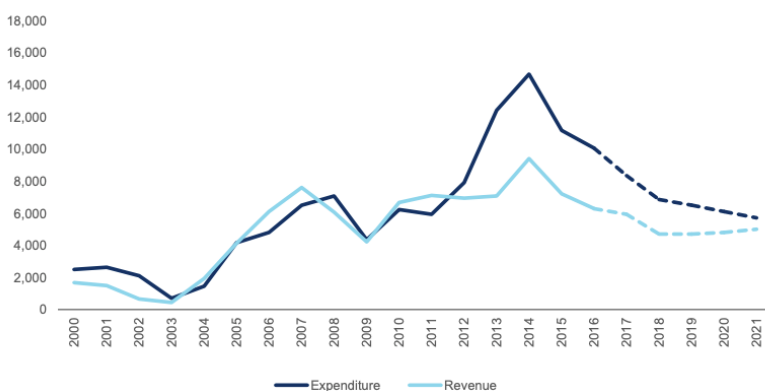
75. **In 2019, with Australia’s support, the Department of Transport and Infrastructure (DOTI) commissioned a Transport Sector Funding Strategy.**³⁶ The strategy notes that since 2012, government expenditure has consistently exceeded revenue, and, even taking into account projected revenue increases, convergence between revenue and expenditure is unlikely until at least 2023 (Figure 21).

76. **The government’s National Executive Committee recently endorsed the Connect PNG Infrastructure Development Program 2020–40,** aiming to improve key economic road transport network connectivity by linking the four main regions—Momase, Highlands, Southern, and New Guinea islands. The program will rehabilitate, upgrade, and connect missing links over about 16,000 km, and is estimated to cost about PGK 21 billion (US\$6.9 billion) over its 20-year implementation.

77. **Development partners in the sector continue to be a vital source of financial and technical support for the government.** Since 2017, the ADB has been implementing a 10-year US\$1 billion investment program to support a performance-based maintenance approach for the Highlands Highway, the country’s most economically significant road corridor. In 2018, Australia’s Department of Foreign Affairs and Trade launched a program to support reforms in the road sector for (i) overall coordination of road sector reform, (ii) regulatory and institutional reform to reduce inefficiencies in the sector, and (iii) institutional support to introduce more effective and efficient road management practices. The World Bank is supporting the road sector through the rehabilitation of the Hiritano Highway and has successfully piloted performance-based maintenance regimes on this key national corridor.

78. **A framework is needed to determine fiscally responsible funding amounts from the government to the transport sector, taking into consideration current and future financial commitments.** It is also important to monitor which future revenue streams are used to secure development partner loans so that the government does not overcommit to lending that it will be unable to service in the future.

Figure 21. Papua New Guinea Government Expenditure and Revenue



Sources: DOTI (2019), *Transport Sector Funding in PNG*; DFAT, 2018, *Office of Development Effectiveness Report*.

79. **Improving transport infrastructure with sustainable and disaster-resilient qualities is a national-level objective identified by the government.** The government has prioritized quality infrastructure and utilities to create an enabling environment for economic growth, increase employment and

³⁶ Department of Transport and Infrastructure. *Transport Sector Funding in PNG*. September 2019.

government revenue, and improve service delivery. Through the MTDP3, covering 2018–22, the government has committed to investing substantially in critical transport infrastructure to reduce the cost of doing business and expand and stimulate economic growth. The government also launched the National Road Network Strategy (NRNS) 2018–37, which sets out a “maintenance first” policy, focusing on preserving existing road networks and corridors on the Core National Road Network (17 key corridors of about 2,309 km). The NRNS gives these sections priority over other road sections for the allocation of periodic and maintenance funding to maintain them in “fair–good” condition, and funding to rehabilitate and improve them from “poor” condition to “good” condition.

ii. Aviation and maritime/waterways subsectors specific issues

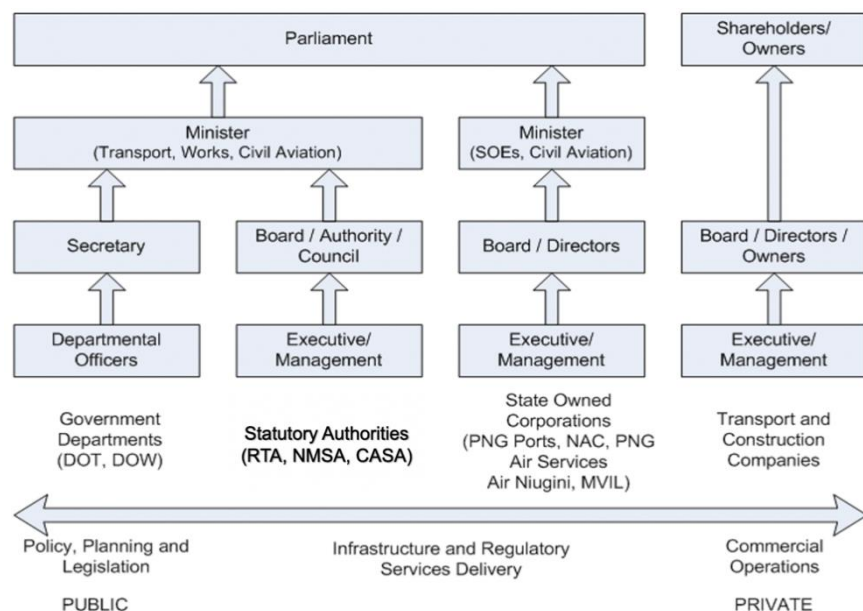
80. **NAC has benefitted from a comprehensive upgrade of its assets through the ADB-financed CADIP and the Japan International Cooperation Agency (JICA)-financed Nadzab Airport Redevelopment Project:** pavement and apron upgrades, runway extensions, new terminal buildings, and security fencing to meet ICAO safety and security requirements. These upgrades have enabled NAC to raise higher revenues, with increased passenger numbers and aircraft movement (NAC 2017).

81. **PNGPCL was in a strong financial position as of 2017, with a strong asset base achieved through significant investment in capital assets** (PNGPCL 2017). Its operations are profitable, and its operating revenue, derived from berthage, pilotage, and storage has grown steadily over five years, reflecting strong business growth. Its revenue base is well diversified, with its largest contributors from Lae Port, Motukea, Rabaul, and Kimbe. PNGPCL manages its debt levels well, maintaining a debt-to-equity ratio of below 0.5, and a debt ratio of 0.3. It has used its borrowings wisely and completed a series of capital projects, including the new PGK 1 billion Motukea International Port—which is expected to improve port productivity—and the development and commercialization of the western side of Lae Tidal Basin, which will provide new service utilities and a new liquid bulk berth.

e. Transport sector institutions

82. **The institutional setup of Papua New Guinea’s transport sector (Figure 22) is functional for the sector, and there is a clear delineation of responsibilities across each subsector.** However, a more explicit mandate and better funds repartition within the same subsector need to be defined, for example, with regards to road maintenance, which is under review. Resources across institutions are less consistent. As might be expected from their commercial orientation, SOEs generally perform well and meet service expectations. It is important to note that the structure illustrated is focused at the national level and does not highlight the importance of provincial and district administration’s roles in delivering rural infrastructure.

Figure 22. Institutional Structure of Papua New Guinea's Transport Sector



Source: National Transport Strategy 2013 (with updates).

83. Following an institutional review (PNG, DoW 2018) led by the Transport Sector Support Program financed by the Government of Australia, the roads subsector is embarking on a comprehensive reform, underpinned by the principles of the NRNS. Some of the reforms recommended in the review have progressed. For example, there is now a single point of accountability for road network management, with the NRA subsumed within the DoW institutional structure. However, further reforms are required so that DoW can optimize the country's scarce resources and effectively manage its existing assets to a maintainable standard while delivering the nation's aspirations of road network connectivity (Connect PNG 2020–40) through capital development.

1.4. Water, sanitation, and hygiene sector

a. Context

84. In recent years, there has been a gradual increase in the number of households with access to improved water supply in Papua New Guinea, but overall access is still very low. The proportion of people with access to improved sanitation—13 percent—has actually decreased over the past two decades. There are huge differences in access to and quality of services between urban and rural areas. The low levels of access to basic water, sanitation, and hygiene (WaSH) services represent considerable costs to the country in terms of illnesses from waterborne diseases and time spent fetching water (Box 5). Papua New Guinea's long-term goal is to increase the population's access to clean drinking water to 100 percent by 2050 (PNG, DNPM 2017). The PNG Development Strategic Plan (2010–30) aims at ensuring that by 2030, 70 percent of the population and 70 percent of its educational institutions will have access to improved water sources and improved sanitation.³⁷ The country is unlikely to meet these targets unless there is a significant and urgent investment in WaSH.

³⁷ PNG Development Strategic Plan 2010-2030.

b. Access to infrastructure and costs

Box 5. Opportunity cost of water in Papua New Guinea *Results of the feasibility study*

In feasibility studies conducted in 2018–19 for new World Bank-financed urban water supply projects in small towns, consultants estimated the opportunity costs of water as follows:

- The avoided costs of fetching water: PGK 426/person/year (for non-coastal areas)
- The lower costs of medicine due to improved public health: PGK 5/person/year
- Reduced illness due to waterborne diseases: PGK 959/person/year

Applying these figures to the estimated 14 percent of the urban population who currently do not have access to improved water supply results in the following calculation:

Urban population: 13% x 8,420,000 = 1,094,600

Urban population without access to improved water: 14% x 1,094,600 = 153,244

Opportunity costs of water: 426 + 5 + 959 = PGK 1,390/person/year

Total opportunity costs of water: 153,244 x 1,390 = PGK 213.1 million per year.

Extrapolating the costs of seven urban areas to the whole of Papua New Guinea, a rough estimate of the cost of not serving the urban population without access to improved WaSH amounts to an estimated PGK 213.1 million per year (about 1 percent of 2018 GDP).

85. **The UN’s Joint Monitoring Program (JMP), which has monitored progress in the WaSH sector since 1990, estimates that as of 2017, 41 percent of Papua New Guinea’s population had access to safe drinking water**—35 percent of the population in rural areas, and 86 percent in urban areas. Besides benefitting from much higher coverage, urban households are nearly five times more likely than rural households to have access to piped water. The majority of these urban households enjoy the convenience of a household or yard connection, rather than the communal standpipe facility found in rural areas.

86. **Urban water supply.** Centralized piped water supply and sewerage infrastructure exist only in the National Capital District (NCD), most provincial capitals, and a few district centers. Two water utilities operate urban water supply systems:

- Eda Ranu is responsible for the NCD, with a network of about 620 km in length supplying water to 18,643 water connections.³⁸
- Water PNG estimates the length of its network at 716 km, supplying water to 30,218 connections³⁹ in 14 provincial capitals and nine district centers.

Together, the two utilities serve about 765,000⁴⁰ people (9 percent of the total population). A merger between Eda Ranu and Water PNG was initiated in 2019. In some district capitals, local-level governments have taken responsibility for operating local water supply schemes.

87. **Rural water supply.** WaSH infrastructure in rural areas consists of basic communal and individual private water and sanitation facilities. However, there are some piped systems in villages and the operational centers of private resource extraction firms. WaSH services are provided by subnational governments, private resource extraction companies (for their operating locations), and non-state actors (faith-based groups and national/international NGOs). Although such non-state actors are important for supporting WaSH

³⁸ These data were provided by Eda Ranu and are for 2019.

³⁹ PWWA Website - Benchmarking data 2018.

⁴⁰ PRIF 2012/2013: Company profiles Eda Ranu and Water PNG.

development in rural areas, they are often focused on specific geographic areas and depend on unreliable funding streams, with limited support for operations and maintenance (O&M). Only about 31 percent of rural households have water supply on the premises; for those that do not, female adults most frequently collect water for the household. Less than one-third (29.7 percent) of households treat their water to make it safer to drink.

88. **Basic sanitation coverage has decreased since 1996.** For basic sanitation, the JMP estimated in 2017 that rural access stood at 8 percent and urban access at 48 percent. Therefore, it had fallen from 13 percent (rural) and 72 percent (urban) in 1996. An estimated 3 percent of rural households have flush toilets, compared to 55 percent in urban areas. About 14 percent of households in rural areas are defecating in the open, compared to 1 percent in urban areas. The two utilities provide urban sewerage services:

- Eda Ranu is responsible for the NCD and serves 12,277 sewerage connections.⁴¹
- Water PNG has sewerage networks in seven towns with 3,129 sewerage connections.⁴²

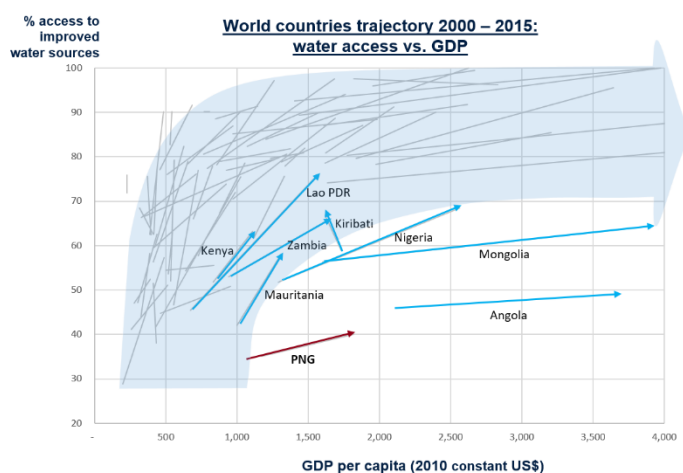
89. **WaSH coverage compared to international benchmarks.** Papua New Guinea has the lowest access to safe water supply and sanitation in the Pacific—and some of the lowest access rates in the world⁴³ (Table 9). Also, the increase in access to water supply for 2000–15 compared to the considerable increase in GDP per capita is very low compared to other countries (Figure 23).⁴⁴

Table 9. Estimated Access to Rural WaSH Services

	Year	Rural population	Access to water supply (%)	Access to sanitation (%)
Papua New Guinea	2010	5,490,000	33	13
Solomon Islands	2010	405,000	35-40	18
Vanuatu	2012	176,800	87	54
World	2010	7 billion	81	47

Source: WaSH PMU 2017 – Papua New Guinea Draft Strategic Plan for WaSH 2017-2022

Figure 23. Water Access versus GDP, 2000–15



⁴¹ Eda Ranu data for 2019.

⁴² Water PNG data for 2019.

⁴³ PNG Draft Strategic Plan for the WaSH Sector 2017–22.

⁴⁴ World Bank Staff Report, 2019.

c. Quality of services

90. **Quality of WaSH service delivery: urban.** The two water utilities provide a reasonable level of service. Water PNG reports that it provides a continuous supply of water to its customers, whereas some 14 percent of Eda Ranu customers experience intermittent supply. The quality of the water supplied by Water PNG appears to be in accordance with standards, but the quality of water supplied by Eda Ranu has been deteriorating over the past years. Both companies report primary treatment to be in place for the (limited volumes of) wastewater collected from customers. Service levels at Eda Ranu appear to be under pressure in recent years.

91. **Quality of WaSH service delivery: rural.** Few data are available to assess the quality of rural water supply facilities in Papua New Guinea. A survey carried out by the World Bank⁴⁵ in 2014–15 among 20 communities with rural water supply systems found that 10 percent of these systems did not function, 15 percent provided substandard services, 45 percent provided improved services, and 30 percent provided satisfactory services. The survey found that in about one-third of the communities, coverage with latrines was high (>80 percent), in one-third medium (20–80 percent), and in one-third low (<20 percent). Some 85 percent of households were using their latrine. Few of the houses with latrines also had adequate handwashing facilities.

92. **Limited access to improved WaSH services undermines public health and is a main contributing factor to Papua New Guinea’s high infant mortality rate** (39.8 deaths per 1,000 births in 2019).⁴⁶ Waterborne diseases, particularly diarrhea, typhoid, and cholera, accounted for 13 percent of deaths and 14 percent of malnutrition in 2009, and stunting was attributed to the lack of safe water, basic sanitation, and hygiene practices. The average incidence of diarrheal diseases in children⁴⁷ (under five years old) in Papua New Guinea is 243 per 1,000,⁴⁸ although in some provinces, the number exceeds 500 per 1,000 children. The country ranks at the bottom of all Pacific economies for all WaSH-related health statistics, with over 6,000 diarrheal deaths per year.⁴⁹ Diarrheal disease serves as an indicator of water quality, food hygiene, and personal hygiene. Public health challenges are compounded by large household sizes, which are increasingly found in urban settlements, putting pressure on household facilities and increasing the likelihood of transmission of infection.⁵⁰

1.5. Digital infrastructure—information and communications sector

a. Context

93. **The regulatory and policy framework for digital infrastructure (telecommunications, Internet) in Papua New Guinea follows well-recognized and successful approaches adopted in economies like Australia.** The sector is vertically unbundled: the international fiber and domestic fixed networks are regulated by the National ICT Authority (NICTA), while the rest of the value chain relies on competition between commercial service providers. The Ministry of Communications and Information Technology (MCIT) provides policy guidance. As the independent regulator, NICTA, in turn, has the responsibility of fleshing out policy by enacting regulatory measures for the four sectors of the ICT market that it oversees. Figure 24 provides a visual overview of Papua New Guinea’s ICT sector.

⁴⁵ WB/WSP 2015: PNG Rural WaSH Sustainability Study.

⁴⁶ United Nations 2020 World Population Prospects.

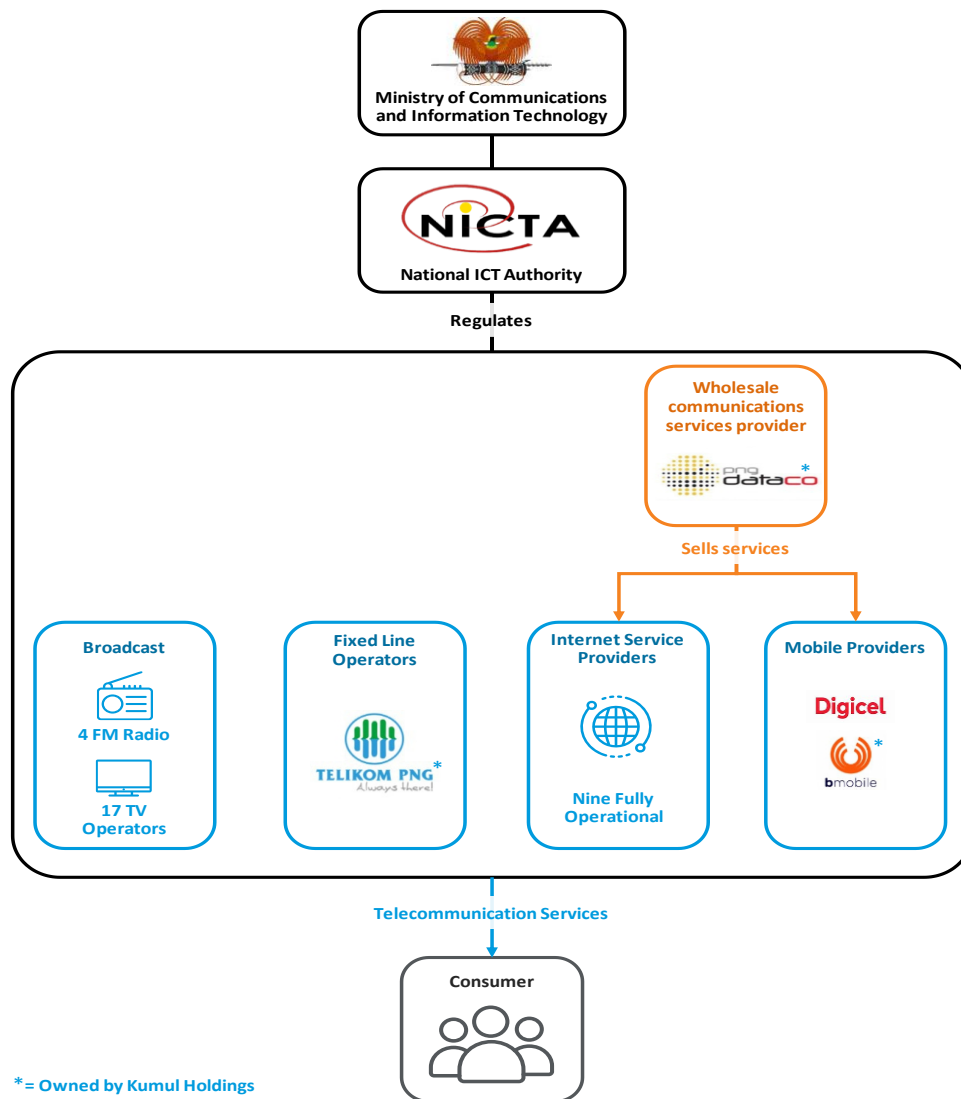
⁴⁷ Some children can have diarrhea several times per year.

⁴⁸ Government of PNG. 2014: Assessment of Sector Performance, 2012–2016: National Report June 2017.

⁴⁹ UNICEF 2019.

⁵⁰ Government of Papua New Guinea. 2010. National Health Plan, 2011–2020. Volume 1 Policies and Strategies. Port Moresby.

Figure 24. ICT Sector Structure Overview



94. However, the structure of Papua New Guinea’s ICT sector differs from many comparable markets, with a dominant commercial entity (Digicel) in the mobile and Internet market competing with several overlapping SOEs acting as both wholesale and retail providers. Three major ICT businesses (PNG DataCo, bmobile, and Telikom PNG) are jointly owned by Kumul Telekom Holdings (KTH), a state-owned holding company endorsed by National Executive Council to oversee all the government’s interests in the country’s ICT sector. KTH is part of the larger Kumul Consolidated Holdings (KCH) entity that holds all the government’s non-mining and non-energy assets and state-owned entities in trust. KCH is currently restructuring the three telecommunication entities under KTH into one entity that it hopes will provide a full range of communications services, from wholesale services to retail mobile and fixed line.⁵¹ PNG DataCo plays a unique role: it is a regulated, state-owned ICT wholesale communications services provider that sells services to other segments of the ICT market, with a monopoly on the control of submarine fiber cables landed in Papua New Guinea.

⁵¹ See “Our Portfolio: Kumul Telekom Holdings.” Kumul Consolidated Holdings. Accessed on April 20, 2020 at <https://www.kch.com.pg/what-we-do/our-portfolio/kumul-telekom-holdings-limited/>.

b. Overview of regulatory and policy structure

95. **Papua New Guinea has a well-developed policy and regulatory structure with ambitious ICT sector targets.**

96. **Policy overview.** MCIT sets ICT policy in Papua New Guinea based on broader government development policies and ICT sector-specific policies. The relevant policies are Vision 2050, the Medium-Term Development Plan 3 for 2018–22, the National ICT Policy, and the Draft National Broadband Policy.

- *ICT in Vision 2050* (Government of Papua New Guinea 2009) specifies that the government should (i) promote and establish the use of ICT for sustainable education, and (ii) ensure that ICT and early warning systems are installed in each province to support economic livelihoods and the environment, especially the education and health sectors.
- *Medium Term Development Plan 3 for 2018–22* has two specific goals for the ICT sector: (i) for 2022, an 80 percent target for the proportion of the population with access to the Internet, and (ii) the Kumul Submarine Programme shall install a fiber-optic network throughout the country to provide affordable, high-speed Internet access to communities (PNG, DNPM 2017).
- *National ICT Policy (2008)*, the MCIT’s official policy for the ICT sector, focuses on introducing and maintaining competition in the ICT sector, bridging the digital divide between urban and rural settings, and leveraging ICT for educational purposes.
- *National Broadband Policy (2013 Draft)*, which defines broadband to mean services that have a minimum download speed of 512 kilobits per second (kbps), is driven by the principles of “market driven, community involvement and ownership, universal access, affordability, and government intervention to correct market failures.” The policy encourages the engagement and involvement of the private sector but is underlined by government resourcing constraints. Specifically, the policy aims to achieve the following goals, which are supported by a strategic action plan included in the draft policy:
 - To have in place a competitive structure for the provision of broadband in Papua New Guinea.
 - To achieve broadband service availability of 100 percent in urban areas and 70 percent in rural areas during the next five years; and by 2018, 90 percent of the people of Papua New Guinea shall have the ability to access broadband services.
 - To provide 100 percent of all primary and secondary schools in urban areas and 80 percent of all primary and secondary schools in rural areas with broadband access to the Internet during the next five years.

97. **NICTA’s regulatory role is clear, but its enforcement capacity is weak, including on prices.**

The NICTA was constituted by the National Information and Communication Technology Act of 2019 as both the economic and technical regulator for the ICT sector. In support of MCIT’s policy goals, the NICTA has issued regulatory determinations on pricing and access to several components of the digital sector. The NICTA has issued specific pricing principles for UAS-funded towers, submarine cable service costs, broadband capacity services costs, and fixed and mobile terminating access services. The NICTA has also issued determinations on confidential information disclosure and registering subscriber identification module (SIM) cards. Finally, the NICTA has proposed draft Quality of Service (QoS) reporting regulations in line with the Standard and Special Conditions of Individual Licences Rule 2011 (the Licence Conditions Rule).

c. Overview of ICT Markets

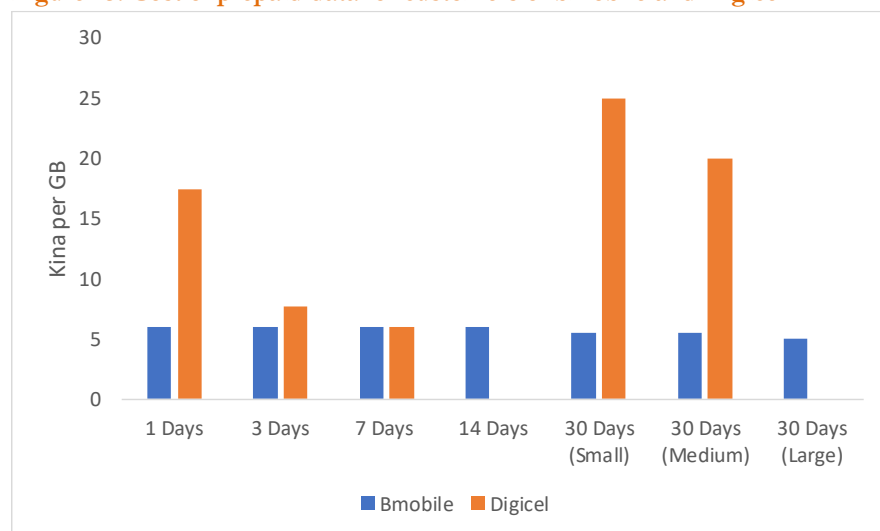
i. Mobile providers

98. **Two mobile providers, Digicel and bmobile, are currently active in Papua New Guinea’s mobile market.** However, as recently as the end of May 2020, ATH International Venture, through Digitech Communications, has sought a license to operate in the mobile market. ATH international ventures, which also owns Vodafone Fiji, purchased a 70 percent stake in Digitech Group Companies. Digitech Group currently provides Internet services, computing hardware, and software and cloud services in Papua New Guinea.⁵² This transaction represents the return of the Vodafone brand into Papua New Guinea’s mobile market via Digitech. Digitech was rolling out mobile infrastructure before the interruption caused by the COVID-19 pandemic.

99. **Digicel has a dominant share of the market.** In 2019, before Telikom exited the mobile market, Digicel had a 91.98 percent market share, bmobile/Vodafone a 5.5 percent market share, and Telikom PNG a 2.51 percent market share (Highet et al. 2019). At present, bmobile’s market share is estimated to be between 10 and 15 percent, suggesting that bmobile has absorbed Telikom PNG’s market share and gained slightly on Digicel.

100. **Bmobile’s rise in market share appears to be driven by its offering of cheaper services.** Cost comparisons between carriers are difficult because each one offers complex and unique packages. However, on average, Digicel appears to be more expensive than bmobile (Figure 25 compares the cost of data for individual customers on prepaid plans). The only plans for which Digicel is cheaper than bmobile contain limited unrestricted data and are heavily weighted toward data that can only be used on social media. Unrestricted data on Digicel’s network is nearly four times the cost of similar data on bmobile’s network. Despite some gain in market share, it appears that bmobile exerts only limited competitive pressure on Digicel. There appear to be concerns with the quality of bmobile’s service compared to Digicel’s.

Figure 25. Cost of prepaid data for customers of bmobile and Digicel



Source: Digicel and bmobile websites.

Note: Digicel’s 3-day plan includes 300MB of unrestricted data and 1GB of Social Plan; their 7-day plan includes 1GB of unrestricted data and 4GB of Social Plan.

⁵² COMMS Update. 2019. “ATH acquires 70% stakes in Digitec Communications and Etech ICT.” *COMMS Update*, May 30. <https://www.commsupdate.com/articles/2019/05/30/ath-acquires-70-stakes-in-digitec-communications-and-etech-ict/>.

ii. Internet service providers (ISPs)

101. **At present there are 59 licensed ISPs in Papua New Guinea**, although it is unclear how many of them are fully operational (Lume 2017). In 2017 only 9 of the 30 licensed ISPs were fully operational.

102. **Fixed telecommunications network.** SOEs owned by KTH have a monopoly on the open-access fixed communications network.

- Telkom PNG has a monopoly on fixed telephony. In 2017, Telkom PNG serviced 24,000 fixed-line connections. There are no current plans to invite a new entrant to compete with Telkom PNG on fixed-line communications.
- KTH's business units are the only wholesale communications services providers in Papua New Guinea; PNG DataCo is the lead implementing agency for the Coral Sea Cable—which landed in March 2020—and for the Kumul Domestic Submarine Cable, which is scheduled to be completed in 2020. Bmobile reports that as a result of the Coral Sea Cable, wholesale data prices have dropped from US\$500 per megabit (Mbps) to US\$100 per Mbps. However, this is significantly higher than the regulated price approved by the NICTA of K185 per Mbps—which equaled US\$54.44 per Mbps on December 17, 2019, when the NICTA published its decision, and currently equals US\$53.64. In any case, the price of US\$100 per Mbps may not be available to everyone, as at least one ISP consulted stated that PNG DataCo was offering US\$400 per Mbps.

d. Quality of services

103. **Historically, ICT performance in Papua New Guinea has been very poor, and updated statistics are not readily available.** Available data suggest that network coverage is increasing, but there are still large areas of the country without any coverage or Internet service. Fixed broadband and fixed-line telephony coverage is limited to urban areas. The NICTA reports that 80 percent of the population lives within mobile network range (though they may not all have access because of lack of devices, weak signal, or lack of affordability).⁵³ The Global System for Mobile Communications Association (GSMA) reports that the 3G mobile broadband network covers 40.9 percent of the population. Mobile broadband is growing rapidly: mobile Internet penetration grew by 20 percent in 2018 (Highet et al. 2019), but data on the breakdown between 3G and 4G are not available.

104. **Further network expansion is complicated by Papua New Guinea's rough, remote terrain, which requires the use of helicopters to place towers on remote hilltops.** In addition, land access issues and operating costs are significant; towers are often vandalized, and diesel fuel is stolen from the generators used to power the stations.⁵⁴ Beyond physical constraints, demand-side issues limit coverage expansion. The GSMA estimates that average revenue per user in rural and remote Papua New Guinea is very low (approximately US\$0.60–0.90), with limited numbers of customers per site. This makes the business case for tower deployments and operations complex, without external subsidies (Highet et al. 2019).

105. **Fixed telephony is limited and unlikely to grow.** Fixed-line telephony is limited to urban areas and reaches only 2 percent of the population (Rupokei 2019). In line with global trends, it is unlikely to expand.

106. **Mobile telephony and Internet uptake have steadily increased since the introduction of competition in 2009.** In 2019, Papua New Guinea had 2.5 million unique mobile subscribers, among whom there were 999,396 mobile Internet subscribers (Highet et al. 2019). This translates to mobile penetration of 30 percent and mobile Internet penetration of 11 percent. Over time, mobile uptake has increased steadily in Papua

⁵³ Email from Jackson Kariko of NICTA on June 16, 2020.

⁵⁴ Athula Biyanwila (CEO of bmobile) during stakeholder consultation conducted via teleconference, May 4, 2020.

New Guinea. In 2007, teledensity in the country—including fixed and mobile telephony—was 4 percent. In 2009, following the introduction of competition in mobile telecommunications, mobile penetration rose to 20 percent (World Bank 2019b). The 30 percent penetration in 2019, therefore, represents an additional gain of 10 percentage points. Even lower prices for mobile Internet facilitated by the completion of the Coral Sea Cable should incentivize further mobile Internet uptake.

107. **The uptake of fixed broadband Internet is low.** In 2019, only 0.4 percent of the population had an ADSL/fiber Internet connection (Rupokei 2019). This low figure, combined with mobile Internet penetration, means that only 11.4 percent of the population has a personal Internet connection. Significant new investment in fiber connections to the premises will be critical in urban areas to meet the needs of businesses, government, and private households for high-bandwidth, high-quality fixed Internet services.

108. **Uptake is skewed toward young and urban populations.** Almost 70 percent of Internet users reside in the cities of Port Moresby and Lae. In rural areas, connectivity and power issues are barriers to Internet access. Internet users also tend to be young—almost half (48 percent) are between 18 and 24 years old, and 82 percent are under the age of 34 (Highet et al. 2019).

109. **The completion of the Coral Sea Cable is expected to significantly reduce the cost of data.** Papua New Guinea ranks very low on affordability globally. In the ITU's most recent ICT services affordability rankings (ITU 2016), the country ranked 137 in affordability of fixed broadband,⁵⁵ 162 in affordability of mobile-broadband for a prepaid handset-based package of 500 MB,⁵⁶ and 158 in affordability of mobile-broadband prices for a post-paid computer-based 1 GB package.⁵⁷ The completion of the Coral Sea Cable is expected to reduce the cost of data significantly. Analysis of data costs for bmobile and Digicel shows that costs have already fallen, although it is unclear what role the completion is playing in current pricing. For example, 1 GB of mobile data on Digicel's network costs roughly US\$5.02, or 2.4 percent of GNI per capita—a dramatic decrease from 2016. Regulatory intervention by the NICTA also likely played a role in reducing data prices.

e. Demand for ICT services

110. **The existence of a large underserved population in Papua New Guinea suggests that there is significant untapped demand for ICT services in the country.** The government hopes to tap that demand so that the new Coral Sea Cable will be well utilized.

111. **Lower-cost data and ICT hardware will lead to higher uptake of ICT services.** Demand has been constrained by the high cost of mobile handsets and mobile data and limited coverage. Both Digicel and bmobile are attempting to address the barrier of costly handsets by introducing low-cost 4G-enabled handsets. Bmobile reports that it can now offer handsets that cost around US\$60 and plans to be able to offer handsets that cost US\$50. Moreover, they have seen that 4G handsets enable low-income customers to make use of cheaper data to watch movies, listen to music, and engage in distance learning.⁵⁸

112. **Engaging with women will increase demand.** Mobile carriers and the government are making an effort to promote demand among women. The GSMA reports that “there is a gender gap in mobile phone ownership and usage which prevents women from realizing the full range of benefits; women are 10 percent less likely than men to own a mobile phone and 23 percent less likely to use mobile Internet” (Highet et al.

⁵⁵ Fixed broadband packages are priced at US\$21.67 per month (11.61 percent of GNI per capita per month).

⁵⁶ Mobile broadband packages are priced at US\$23.84 per month (12.77 percent of GNI per capita per month) for a prepaid handset-based package of 500 MB.

⁵⁷ Mobile-broadband, post-paid computer-based 1 GB packages are priced at US\$39.34 per month (21.07 percent of GNI per capita per month).

⁵⁸ Athula Biyanwila (CEO of bmobile) during stakeholder consultation conducted via teleconference, May 4, 2020

2019). To bridge the gap, bmobile has engaged with civil society groups like the Women's Bank to promote ownership and utilization of ICT services among women. Additionally, the NICTA is offering a "Girls in ICT" program that will encourage young women to pursue careers in ICT.⁵⁹

113. **Offering more e-health and e-education services.** Offering additional electronic services will increase demand for ICT services. Both Digicel and bmobile offer mobile banking services that are already increasing demand. In addition, bmobile has noted that it would like to offer e-health and online education services but does not believe that the Department of Health and the Department of Education have adequate platforms in place for such services.⁶⁰

114. **The government's recent policy decision to register SIM cards may make it harder to bridge the urban/rural divide in ICT services uptake.** Literacy challenges and a large number of people without formal identification have made it difficult to register SIM cards in rural communities where most central government services do not reach, and there are significant constraints on movement and access (Highet et al. 2019).

f. Digital sector investment plan

115. **The shape of ICT infrastructure in Papua New Guinea is evolving quickly.** The Coral Sea Cable was completed in early 2020. As a result, the APN2 submarine cable will be decommissioned soon. The PPC1 cable will be maintained primarily as a back-up to ensure coverage should the Coral Sea Cable be damaged.⁶¹ To leverage the benefits brought by the Coral Sea Cable, Papua New Guinea is focusing on:

- Completing the Kumul Domestic Submarine Cable. This cable will bring the benefits of the Coral Sea Cable to the other urban centers. The NICTA confirms that Huawei has completed the Kumul Domestic Submarine Cable up to Rabaul and expects it to land in Bougainville by the third quarter of 2020.⁶²
- Co-locating fiber. Laying fiber along electrification, gas pipeline, and road projects will spread the benefits of the Coral Sea Cable further inland.
- Trialing 5G. ICT service providers in Papua New Guinea are beginning to trial 5G networks whose higher speeds are made possible by the Coral Sea Cable. Bmobile had planned a 5G trial for the middle of 2020, but this was rescheduled to later in 2020 because of the COVID-19 pandemic.

⁵⁹ Kila Gulo-Vui (Director of Economics, Consumer, and International Affairs at NICTA) during stakeholder consultation conducted via teleconference, May 13, 2020.

⁶⁰ Athula Biyanwila.

⁶¹ Kila Gulo-Vui.

⁶² Kila Gulo-Vui.



The government has set the ambitious goal of reaching 70 percent access to electricity by 2030. Strong institutions with clear roles and mandate are key. Photo: Mits Motohashi.

2. Accelerating progress in physical capital development: constraints and opportunities

2.1. General constraints

a. Challenging geography

116. **Geography is the main obstacle to infrastructure development in Papua New Guinea.** The country consists of 600 islands with over 5,000 km of coastline. The landscape of the mainland is dominated by a massive central system of mountain ranges, with mountains up to 4,500 meters in altitude. Active and recently active volcanoes are prominent features. In the lowlands are many swamps and floodplains. Important rivers are the Sepik, flowing to the north coast, and the Fly in the southwest. Papua New Guinea's smaller islands are also areas of extreme topographic contrast. The country is vulnerable to natural disasters, including cyclones/hurricanes/typhoons, earthquakes, tsunamis, drought, flooding, landslides, and volcanic activity. The implications for road infrastructure are plain: it is difficult to build roads in such an environment, and it is also difficult to maintain them—and other infrastructure—in the face of various natural disasters. In turn, the lack of road access makes it difficult and costly to provide energy, WaSH, and ICT infrastructure.

117. **Papua New Guinea has an estimated population of 8.42 million people, of whom 87 percent live in rural areas and 13 percent in urban areas.** The larger towns are Port Moresby, the capital, with a

population of 380,000, and Lae, with about 100,000 inhabitants. At just 14 people per km², Papua New Guinea's population density is low. The population is among the most isolated in the world: four out of five people live in rugged mountainous or coastal terrain. Most of the coastline in the country's maritime provinces is accessible only by sea, and many population centers, particularly along the Sepik, Fly, and Ramu river systems, are accessible only by transport such as small craft with outboard motors, and dugout canoes. Here again, the implications for infrastructure are obvious: without economies of scale, it is both difficult and expensive to provide infrastructure to a scattered and isolated population.

b. Land ownership

118. **A second obstacle to infrastructure development in Papua New Guinea involves access to land.** Over 95 percent of the land in the country is under customary ownership—that is, it cannot be mortgaged or sold. The customary land tenure system has many different decision-making levels, and different owners often have different ideas about the use of a particular piece of land. Because most of the land is not surveyed or registered, disputes often arise. Recognizing the need to use customary land for development purposes, in 1989, the government developed the Land Mobilization Program to secure land tenure for public purposes. However, progress under this program has been slow, and land tenure is often secured through private agreements between customary owners instead of through formal channels. This adds a level of uncertainty to infrastructure development as infrastructure requires secure, uncontested access to land. Road development, for example, can be hindered by disputes with owners of land adjacent to road works (Edmonds et al. 2018). Uncertainty about land rights also makes it more challenging to mobilize private or foreign investments.

c. COVID-19 situation

119. **The COVID-19 pandemic is a third constraint to infrastructure development.** The measures to deal with the pandemic have triggered an economic downturn, reduced business activities, heightened affordability constraints for the people, and weakened the financial sustainability of many institutions. The actual impact of the pandemic, especially on the financial situation of key stakeholders (especially SOEs and private operators), will need to be assessed post-crisis. Still, the constraints on revenues during the subsequent economic downturn will undoubtedly have severe consequences.

2.2. Energy-specific constraints and opportunities

i. Constraints

120. **Financing and investment strategy.** Until recently, Papua New Guinea lacked an integrated sector investment strategy—addressing generation (including blend), transmission, and distribution modeling—that the government could consider against its increasing energy demand. Connected to this is the fact that the availability of concessional financing to the sector has been limited. However, this situation is improving rapidly with the increase in multilateral and bilateral partnerships in the energy sector. Significant financial resources will be needed to achieve the country's targets.

121. **High dependence on fossil fuels.** Papua New Guinea exports much of its fuel resources and imports fossil fuels for domestic use. This practice contributes to the high cost of service.

122. **Limited capacity.** The sector has limited capabilities for policymaking, regulatory, and implementation functions, as well as for sector planning and setting strategic directions to guide energy resource development.

123. **Policy and regulatory impediments.** Defects in the policy and regulatory framework and weak enforcement impair services. Regulatory controls in the power sector are ineffective. Tariffs are set below regulatory allowable revenue levels, a practice that has created chronic underfunding (Lawrence 2017). Institutional mandates for policy, regulation, and planning in power are still being defined (Neto et al. 2019). More work is required on the regulatory framework for SOEs; there is a potential for conflict between SOEs' commercial goals and public service provision. PPL is the country's main energy planner, but its commercial charter is not always aligned with development needs, particularly in serving rural areas (Lawrence 2017).

124. **Institutional issues.** Cost recovery is weak; PPL is in financial distress that threatens its sustainability and the stability of the electricity sector, as it is able to bill for less than 77 percent of the amount of energy it provided in FY17 (Neto et al. 2019).

ii. Opportunities

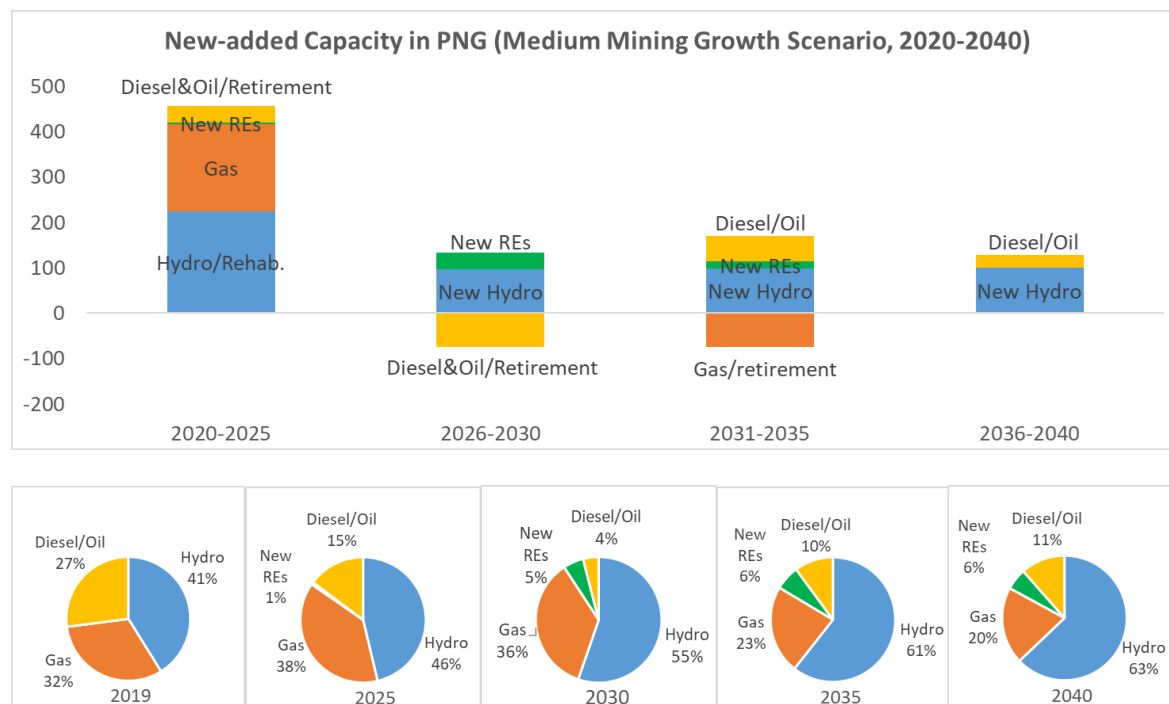
125. **The government has set the ambitious goal of reaching 70 percent access to electricity by 2030 and becoming fully carbon-neutral by 2050.** With World Bank support, the government embarked on an exercise to prepare a National Electrification Rollout Plan (NEROP) for the country. It has carried out geospatial modeling to understand how best to approach electrification efficiently and cost-effectively. This work concluded that delivering on the government's electrification goal will require a comprehensive set of investments in on-grid, isolated mini-grid, and stand-alone off-grid solutions to increase generation capacity by about 76 MW by 2030. At the same time, demand from commercial, industrial, and mining projects is expected to grow significantly over the next few years. The PNG Electrification Partnership, signed in November 2018 by APEC Leaders from Australia, Japan, New Zealand, the United States, and Papua New Guinea, proposes to help Papua New Guinea pursue its electricity access goal. Government leadership is a key component in the implementation of these plans. Collaboration between key state agencies—particularly between PPL and the Department of Petroleum and Energy (DPE)—is crucial, as is the role of the Department of National Planning and Monitoring. Strong institutions with clear roles and mandate are needed and will be held accountable for results.

126. **A least-cost analysis carried out for PPL—developed in 2018 and updated in 2020, with World Bank support—identifies the opportunities to provide affordable power.** The results show that using hydropower and other renewables to generate electricity will be key to meeting the government's access goals and supplying the future demands of industry and mining. Gas generation can play an important role as a transition fuel in replacing liquid fuels (Figure 26). This approach could help lower power costs, expand the grid, and harness the opportunities associated with new gas field developments. In the short term, the rehabilitation of existing hydropower to restore low-cost generation capacity is a key priority.

127. **Significant institutional leadership is needed to establish governance arrangements to carry out power system planning and oversee systematic and coordinated enforcement.** This leadership is an essential requirement to lower supply costs and consumer tariffs and drive sustained economic growth in the industrial, commercial, and residential sectors.⁶³ In addition, the least-cost plan must be updated periodically to incorporate new developments in the energy sector and international markets. It will be equally important to rigorously enforce adherence to the plan and select investment projects through competitive procurement processes. With World Bank support, some improvement measures are already being carried out.

⁶³ The Bank has been providing technical assistance support to PPL for feasibility and preparatory studies for the development of the Naoro-Brown Hydro Power Project, including preliminary transaction advisory support to launch a competitive tender for selecting a developer.

Figure 26. A Summary of Least-Cost Power Generation for 2020–40 (MW)



Source: World Bank 2020.

128. **Mining loads present an opportunity to expand the power sector.** Compared to a business-as-usual scenario, a high-mining-growth scenario would require an additional total installed capacity of over 1,000 MW by 2030. Mining companies’ need for a reliable long-term supply and their ability to pay for electricity services could help to underwrite new investment in generation, transmission, and distribution assets. For this reason, incorporating projections of demand for electricity from existing and planned mines is a key component of power system planning. Discussions are ongoing with several mining companies that could be connected to the electricity grid and thereby enable new investments in power generation and grid extension that could help build stronger power systems connecting major load centers, and anchor electrification of nearby communities.

129. **A detailed implementation plan to operationalize the NEROP is under preparation.** The World Bank is assisting the government in (i) defining the technical standards for electricity distribution in urban, peri-urban, and rural areas, with the aim of optimizing investment cost per new connection in full compliance with applicable levels of quality of electricity service; (ii) defining the main institutional arrangements to implement the NEROP, the required technical and service standards, and the financing mechanisms for the electrification programs and plans; and (iii) identifying and preparing an electrification investment program (grid extension, off-grid/mini-grid electrification) and an action plan for the initial 3–5 years.

130. **Significant financial resources would be needed to achieve Papua New Guinea's electrification targets and meet its growing demand for electricity.** Providing electricity to 70 percent of households would require investment worth more than US\$700 million in power distribution, including on-grid electrification and isolated mini-grid projects (World Bank estimate). Moreover, the power sector will need to meet growing demand from all customer segments, driven by the mining sector’s anticipated growth. This would require additional significant investment in power generation (US\$0.2-4.6 billion) and transmission (US\$0.3-1 billion).

2.3. Transport-specific constraints and opportunities

i. Constraints

131. **Resources are limited, but the needs and costs for transport infrastructure maintenance and investment are high.** The cost of building and maintaining a road network that is extensive enough to service the entire population is high, if not economically unfeasible. More accurate cost estimates are yet to be made. Still, according to the Connect PNG document, the government estimates the gap at US\$6.9 billion equivalent over the next 20 years, representing roughly 30 percent of current GDP. Budget appropriations for road maintenance and the use of output-based maintenance contracts have not kept pace with the deterioration of the national and subnational road network. Beginning in 2014, a fall in commodity prices negatively affected economic performance, and government revenues declined. As a result, transport-related expenditures fell by 35 percent between 2016 and 2017. In addition, there was a systemic inefficiency in how scarce funds were expended, with an emphasis on distributing funds to small projects, rather than prioritizing the maintenance of priority corridors and measuring the road condition as part of contractual arrangements. In this context, the government's launch of the NRNS to prioritize maintenance is a positive development. The launch of the first output-based maintenance contract on the Hiritano highway (supported by the World Bank) constitutes a good response to the government's new emphasis on maintenance first. In the aviation sector, without adequate and predictable funding for rural airstrip restoration and maintenance, the condition of Papua New Guinea's rural airstrips will progressively decline, with the risk of some closures in the medium term. The RAA will be dependent on annual allocations from the consolidated budget, as the airstrips it manages are unlikely to recover the costs that are incurred for their restoration and maintenance from their traffic. According to the 2018 national budget outcome, RAA received a PGK 9.1 million annual allocation to maintain the 90 rural airstrips under its responsibility, averaging about PGK 100,000 per airstrip. Such a figure is likely to be inadequate to maintain a steady state of asset condition. More resources will be required to restore the rural airstrip inventory to a maintainable standard. Low traffic levels make PPPs challenging, as the potential revenues for private partners are modest in those areas.

132. **Competition with key economic sectors.** Funds are limited, and the government has priorities for other key economic sectors to support sustainable and inclusive development. Although the transport sector's capital budget allocation is the largest of all sectors, the recurrent/operational budget remains a priority for the government as it must pay salaries to public servants and service public debt on time. The budget also prioritizes district services improvement programs (DSIPs) and provincial services improvement programs (PSIPs). Currently, the transport sector is fourth in the priority list of government spending (Table 10).

133. **Limited capacity.** Since 2013, the NTS has called for increased capacity for the public sector. This includes the public sector's role in policymaking, regulating, planning, and overseeing the transport sector, including the road, air, and maritime/waterways subsectors. In parallel, private sector actors (contractors, consultants, maintenance facilities, and so on) require capacity strengthening to perform their roles. This capacity building underscores a medium- and long-term endeavor to create a pool of professionals that can be operational immediately, with a vision to prepare for future generations.

Table 10. Government Expenditure Plan by Sector, 2020

(PGK million)

Sector	2020 Operational	2020 Capital	2020 Total Expenditure	% of Total Budget
Administration	852.3	1,307.7	2,160.0	11.5
Community and culture	65.0	45.0	110.0	0.6
Economic sector	276.3	457.5	733.8	3.9
Education	1,082.1	160.6	1,242.7	6.6
Health	1,320.2	491.0	1,811.2	9.7
Law and justice	1,224.2	188.4	1,412.4	7.5
Provinces	2,932.3	1,276.9	4,209.3	22.5
Transport	275.1	1,602.6	1,877.8	10.0
Utilities	39.8	451.0	490.8	2.6
Miscellaneous	2,521.6	0.0	2,521.6	13.5
Debt service	2,156.9	0.0	2,156.9	11.5
Grand Total	12,745.8	5,980.5	18,726.5	100.0

Source: Department of Treasury.

134. **Policy and regulatory impediments.** The area of policy and regulatory frameworks has been neglected somewhat, as priority was given to infrastructure investment in all transport subsectors. Donor-financed technical assistance is helping to fill the capacity-strengthening gap, but such support is not sustainable unless there is a clear commitment from the government to involve its civil servants or national consultants in long-term endeavors to set up and implement a well-designed policy and regulatory framework. Stakeholders' ownership of the policy and regulatory framework and its implementation will be critical to successful reforms in the three transport subsectors (roads, air, and maritime/waterways).

ii. Opportunities

135. **Consolidation of previous experiences after the COVID-19 crisis: an opportunity to better reflect on a phased approach for subsector priorities.** The government has launched several strategies that aim to improve transport networks, boost connectivity, and support economic development. In February 2010, it published the National Strategic Plan (Vision 2050), an economic development framework. Vision 2050 contained long-term transport development goals supporting the government's objectives of service delivery, human capital development, and wealth creation. In 2013, the NTS identified national road maintenance as the country's top transport priority. In 2018, the NRNS developed the government's objectives through 2037. In April 2020, the government adopted the Connect PNG Infrastructure Development Program 2020–40. Connect PNG aims to enhance sustainable socioeconomic development and national cohesion and unity by connecting the country's four main regions (Momase, Highlands, Southern, and New Guinea Islands) with an improved road transport network. It is urgent to harmonize those strategies, sometimes with contradictory priorities (for example, the "maintenance first" NRNS stated policy versus the tendency to develop new economic corridors in the Connect PNG program).

136. **The time has come to implement plans and see them through.** Changes of government in Papua New Guinea tend to prompt new vision documents and new transport policies. Sticking to a well-considered implementation plan will provide consistency to stakeholders (government, implementation agencies, contractors, consultants), greater visibility, and better facility to plan and adapt strategies.

137. **For air and maritime transport, the development of nationwide infrastructure maintenance and investment plans is beneficial to all stakeholders, including the public.** Increasing the number of

jetties and wharves across coastal provinces and developing or maintaining paved or upgraded airstrips across the country is critical, particularly for the large segment of Papua New Guinea's population without road access.

138. **Road rehabilitation will contribute to economic recovery** by supporting the country's imminent investment boom. The planned Ramu Highway rehabilitation near the Ramu NiCo mine area, for example, will facilitate the transfer of nickel and cobalt shipments to ports in the regions of Lae and Madang.

139. **In its growth strategy to 2030, NAC targets the operation of 15 smart airports by 2030**—that is, airports compliant with the minimum ICAO Recommended Standards and Practices for airport operations under CAR Part 139. Such airports would meet globally accepted standards in airport terminal buildings and infrastructure, with safe, clean, and secure airport environments and runway lengths and runway pavement strengths that meet recommended specifications.

140. **Developing further reflections regarding transport services will help to make those services more efficient, beyond the question of building resilient infrastructure.** The use of PPPs, especially in the context of constrained public financing, regulation (or deregulation) of services, and safety and security in all transport modes, could be strengthened and increased.

141. **Private sector participation in the ports sector appears to be progressing well**, with PNGPCL outsourcing its terminal operations to Philippines-based International Container Terminal Services, Inc. (ICTSI). ICTSI's Papua New Guinea-based subsidiaries signed 25-year terminal operating agreements to operate Motukea and Lae Ports, covering the operation, management, and development of the two ports.

142. **NAC is also actively pursuing improving private sector participation by exploring appropriate PPP arrangements** (with ADB support) for JIA.

2.4. Water, sanitation, and hygiene-specific constraints and opportunities

i. Constraints

143. **High capital investment costs.** Capital investment costs in the water sector in the Pacific Region (including Papua New Guinea) can reach US\$1,000–1,500 per beneficiary in small towns, compared to typical unit costs below US\$500 per beneficiary in other regions. Similarly, the cost of construction supervision can represent 15–20 percent of capital investment, a rate two to three times higher than in other countries. Cost premiums are driven primarily by (i) the remoteness of location sites from the main suppliers' and contractors' markets (Australia/New Zealand, East Asia), (ii) the lack of economies of scale, especially in rural areas, and (iii) premiums put on costs due to security risks and, more generally, the perceived risks of operating in Papua New Guinea.

144. **Policy and regulatory impediments.** Until 2015, Papua New Guinea had no single body charged with overall responsibility for developing and implementing policy for the WaSH sector. As a result, strategic planning, sector investment planning, budget allocation, and program coordination were neglected. In recent years, however, the sector has received more interest and been prioritized by the government. January 2015 saw the approval of the National WaSH Policy, describing the goals, objectives, and principles to be applied in implementing the policy and providing for the establishment of a National Water, Sanitation and Hygiene Authority (NWSHA) as the anchor agency for policy implementation, sector regulation, coordination and systematization, monitoring, and capacity building. Since the approval of the policy, significant work has taken place: (i) the establishment of a WaSH Project Management Unit (WaSH PMU) as the lead agency for the sector; (ii) the drafting of a five-year WaSH Strategic Plan 2017–22; (iii) the development of strategies, action plans, and recommendations for capacity development in the WaSH sector; (iv) the preparation of draft legislation for the WaSH sector (still pending approval); and (v) the launch of pilot projects for the development

and implementation of WaSH in 12 districts, which provided valuable experience in the preparation of district-level WaSH plans. Notwithstanding these considerable efforts, however, progress in policy implementation has been slow.

145. **Institutional issues.** Limits on data availability make it difficult to assess service delivery. Papua New Guinea lacks information on recurrent spending for water and sanitation and spending in rural and urban areas. A lack of budget mechanisms for allocating and tracking expenditures to rural and urban water and sanitation impairs services, and logistical and security issues impede data collection (ADB 2018). Data on stunting and diarrhea incidence that could guide WaSH investments are limited. Institutional issues also hinder infrastructure development.

- Certain policy initiatives, such as the Public-Private Partnership Act of 2014, have not yet been made operational, although there has been some private sector participation in the WaSH sector.
- In rural areas, District Development Authorities have responsibility for most service delivery to the local level. However, they have played a limited role in WaSH service delivery. In the past two years, WaSH PMU has initiated WaSH pilots in 12 districts, with the assistance of EU/UNICEF, the World Bank, and the Government of Australia. The pilots all involve the preparation and implementation of District WaSH Development Plans, carried out in close consultation with local stakeholders and communities.
- The Conservation and Environmental Protection Authority is responsible for water resources management, monitoring and licensing the use of water and the discharge of wastewater. Because there is no national inventory of available freshwater resources, water utilities and other stakeholders must conduct time-intensive surveys and very costly exploratory drilling before any water development activity can begin. Unless a programmatic approach is put in place to address this issue at scale, expanding water services to the 80+ district towns one by one will require decades of effort.

146. **Limited capacity.** Human resources in the WaSH sector are currently limited in both quality and quantity. Significant strengthening of the institutional and human resource capacity of the WaSH sector is required to improve service delivery. This will require strengthening the capacity of government agencies at the national, provincial, district, and local levels, ensuring that staff working in the sector have the necessary skills, and attracting new and qualified staff into the sector. The following is urgently needed:

- Identify the WaSH training needs of people working in various capacities in the WaSH sector.
- Arrange for and assist in conducting WaSH training programs for government, SOE, and NGO staff and staff of private operators and contractors.
- Identify and implement approaches to develop and share knowledge among sector stakeholders.

A recent capacity assessment of the WaSH sector by UNICEF (UNICEF 2017) estimated that 9,500+ fully trained staff would be required at the national, provincial, district, and local government levels. In addition, staff are needed for the water utilities, NGOs, church organizations, and the engineering and consultancy firms and contractors involved in the design, planning, construction, operation, and maintenance of WaSH facilities and service delivery.

147. **Limited financial resources.** The investments needed to achieve the government's objectives for WaSH amount to US\$150–200 million per year, excluding an estimated US\$20–30 million per year for O&M. Many financing mechanisms and sources are available to finance the WaSH sector, but funding has been far

below the required level and has taken place in a fragmented and ad hoc manner. Development partners provide most WaSH funding, but these amounts are insufficient to achieve sector targets.

148. **Climate change.** Like other countries, Papua New Guinea will be affected by climate change—higher temperatures, increased rainfall, rising sea levels, and ocean acidification. Coastal flooding, as a result of sea-level rise, will affect coastal regions and, in some areas, may affect the quality of groundwater, water sources and intakes, water quality, and water transportation. Inland flooding and landslides, driven by heavy and irregular rainfalls, may destroy critical infrastructure, affecting water sources and intakes, water quality, and water transportation and distribution systems. These effects will have to be considered in the design, construction, and operation of WaSH facilities. This may involve modifications to current WaSH infrastructure and new design criteria to be applied for new infrastructure.

149. **Social issues.** Across the Pacific, including in Papua New Guinea, inequalities of access to WaSH exist between women and men, rich and poor, and those living in rural and urban areas. People with disabilities need particular attention. Gender inequality is high in Papua New Guinea; the country is ranked 157 out of 187 countries in the UNDP's Gender Inequality Index. Women are taking on more leadership and public representational roles, but in many communities, perceptions of domestic roles and powers, gender equality, and gender norms remain entrenched. Gender-based violence levels are also high (Darko, Smith, and Walker 2015). At the household level, women exercise limited control over resources and household decision-making. Women and girls are responsible for fetching water, boiling water for drinking, and caring for sick family members. Although women are the primary users of water, a 2007 review reported that they are typically excluded from decision-making processes in rural Papua New Guinea and, when they are permitted to attend meetings, are rarely given the opportunity to have their perspectives heard.⁶⁴ Support for civil society participation in rural WaSH governance is necessary to ensure the meaningful participation of women. The Water for Women Fund, supported by Australia, includes gender plans for supported WaSH schemes and Gender Equality and Social Inclusion monitoring. One of the aims of the World Bank's work in Papua New Guinea is to help systematize and encourage the mainstreaming of gender-based approaches in government systems, including the district WaSH plans.

ii. Opportunities

150. **Urban areas in Papua New Guinea are served by the two water utilities, Water PNG and Eda Ranu, which are merging.** Both operate on a commercial basis and, until recently, have been able to recover their operational and at least part of their capital costs. The proportion of non-revenue water is high, and there are other inefficiencies. In addition, both utilities need assistance in improving their creditworthiness, allowing them to access finance from private investors. Nevertheless, the two utilities are relatively strong organizations in the WaSH sector and could potentially play an important role in further expanding WaSH coverage.

151. **Ample scope exists to expand the role of the utilities in increasing the coverage of WaSH in urban and rural areas.** Still, it would require extending service delivery to areas where it is difficult to realize their commercial objectives. Therefore, financial mechanisms, such as community service obligation (CSO), would need to be considered to ensure the utilities' financial viability. Eda Ranu could focus on expanding WaSH service delivery into peri-urban areas and informal settlements in the NCD area, and Water PNG could greatly expand service delivery to urban centers and provide technical support to district authorities in the planning, operation, and maintenance of water and sanitation facilities throughout the country. This would

⁶⁴ ISF – University of Technology, Sydney 2011: PNG WaSH Sector Brief.

require the operationalization of the CSO Policy (approved in 2012), which provides a framework for identifying and financing noncommercial services by SOEs.

152. **For rural WaSH, service delivery through DDAs by preparing, resourcing, and implementing WaSH District Development Plans appears a promising mechanism.** This mechanism could lead to a much more systematic and sustained approach and has the potential to generate financial support by different levels of government and various donors. However, this approach will need strong sector coordination and extensive and sustained support from all stakeholders over a long period of time.

153. **Where high-quality WaSH District Development Plans have been developed, coordinated funding through the Provincial and District Services Improvement Programs may offer one of the best chances of seeing an increase in WaSH investment in PNG** (World Bank 2019c). Key strategies to improve WaSH services include increasing funding, developing and managing an effective management information system, developing more consistent approaches to WaSH service delivery, promoting the use of appropriate technology, and enhancing private sector participation and partnerships and capacity building and training (World Bank 2014).

154. **To meet the training needs in the sector, the UNICEF capacity assessment recommended making use of the three national universities and vocational training schools to implement a National Capacity Development Plan for the WaSH Sector.** Various donor and educational organizations also offer international training programs, and staff in government agencies could provide capacity-building programs—for example, Environment and Health Officers, who have been trained in participatory hygiene and sanitation transformation or in community-led total sanitation (Brown and others 2015). Moreover, the three major international NGOs that are active in Papua New Guinea’s WaSH sector—World Vision PNG, WaterAid PNG, and OXFAM PNG—all have national programs in WaSH sector development and have both functional and technical capacities (in varying degrees) to assist the government in WaSH service delivery and in sector capacity development.

2.5. *ICT-specific constraints*

155. **The government’s ownership of a number of telecommunications companies, combined with the presence of government-owned companies across the entire value chain, is the key obstacle to increased investment in the sector** and improved outcomes for consumers through greater competition. Through its holdings, KTH has effectively created a state-owned vertically integrated ICT company that, through PNG DataCo, has engaged in a vertical squeeze by restricting access to the new Coral Sea Cable. Additionally, government ownership of bmobile has resulted in severe constraints on bmobile’s balance sheet, lack of investment, and lack of competitive success. At the same time, the presence of bmobile in the market—albeit constrained by its government ownership—has until now discouraged other potential competitors from entering the market. The absence of new entrants has enabled Digicel to entrench itself. This, in turn, has delayed the development of the regulatory regime.

156. **Lack of real competition in the mobile space due to the poor performance of SOEs.** Digicel offers a wider coverage area and more reliable service than bmobile, limiting bmobile’s ability to compete effectively. The ongoing under-capitalization of government-owned bmobile prevents it from contributing to increased consumer welfare through more effective competition. Bmobile would require additional capital infusions to improve its service and network coverage. In a recent interview, when discussing needed investments in the country’s SOEs, the Minister for State Enterprises, Sasindran Muthuvel, stated, “We are in a desperate situation to see that we also attract some private investment or industry partners to come and join us.” Mr. Muthuvel also noted that “KTH [bmobile’s parent company] had invested more than PGK 2 billion

in the new cable infrastructure, but did not have the capacity to service the associated loans.”⁶⁵ The recent announcement of ATH’s interest in entering the market will likely provide real competition. ATH Group also owns Vodafone in Fiji, where it has the largest market share and competes directly and successfully with Digicel. When Digicel entered Fiji’s market, competition between Digicel and Vodafone led to more competitive pricing for mobile services.⁶⁶

157. **Tower-sharing regulations are a work in progress.** At present, the only shared towers are those funded by NICTA’s Universal Access and Service (UAS) program. Beyond the UAS towers, the NICTA is investigating whether or not to mandate tower-sharing for towers outside the UAS program. In a previous decision, the NICTA chose not to mandate tower-sharing; however, it has decided to revisit that decision, and the recent entry of a new competitor adds urgency to the review.⁶⁷ The NICTA plans to complete its review in the second half of 2020.⁶⁸ In addition, the NICTA is planning a consultation on sharing passive infrastructure.⁶⁹ These investigations are at an early stage; however, like tower-sharing, the issue is more relevant now that a new competitor is entering the market.

158. **There is concern that number portability may increase Digicel’s market dominance in the mobile space.** The NICTA has not approved number portability because it is concerned that allowing it would encourage existing bmobile customers to leave bmobile for Digicel, further increasing Digicel’s market dominance.⁷⁰ Like tower-sharing and passive-infrastructure-sharing regulations, number portability will be key to allowing the new competitor entering the market to compete successfully with Digicel.

⁶⁵ Business Advantage PNG. 2020. “Privatisation on the agenda for Papua New Guinea’s state-owned enterprises?” Business Advantage PNG, February 24.

⁶⁶ Chanel, Sheldon. 2018. “Vodafone Fiji Plans to Unlock Potential in Telecom Market.” *Fiji Sun*. August 11. <https://fijisun.com.fj/2018/08/11/vodafone-fiji-plans-to-unlock-potential-in-telecom-market/>.

⁶⁷ Athula Biyanwila (CEO of bmobile) during stakeholder consultation conducted via teleconference, May 04, 2020.

⁶⁸ Charles Punaha (CEO of NICTA) during stakeholder consultation conducted via teleconference, June 4, 2020.

⁶⁹ Kila Gulo-Vui (Director of Economics, Consumer, and International Affairs at NICTA) during stakeholder consultation conducted via teleconference, May 13, 2020.

⁷⁰ Kila Gulo-Vui.



It is important to find ways to involve the private sector in providing and maintaining the country's infrastructure. Photo: David Ling.

3. Recommendations and priorities for improving infrastructure

159. **The preceding chapters have shown that Papua New Guinea does not have the infrastructure it needs to lift its people out of poverty**—to improve their health status, to pursue economic and educational opportunities, to be connected with one another and with the rest of the world. In the past decade, with the support of international development finance institutions and donors, the country has taken steps to address its infrastructure situation, but much remains to be done. This section identifies some common themes across the four infrastructure sectors that will be important to address and sets out a range of priority actions in each area of infrastructure—for energy, transport, water and sanitation, and ICT—to help guide decisions about the way ahead.

160. **While the four sectors have their own opportunities and challenges, there are some cross-cutting policy actions that can benefit all.** First, it is important to have consistent regulatory, competition, universal access and investment policies so that providers of infrastructure services – whether they are in the public or private sectors – have a clear and transparent business environment in which to work. Advancing reforms and ensuring good governance and accountability will be essential. Further, investment plans should provide a better balance between infrastructure construction and O&M. Integrating social and environmental considerations into project evaluation and implementation can play a critical role in mitigating risks as well as protecting the affected persons and the environment. Finally, COVID-19 introduces new challenges to

infrastructure development in Papua New Guinea, it will be important to enhance capacity in the infrastructure sectors for emergency preparedness, management, and recovery.

3.1 Energy sector

161. The following measures are recommended to address the challenges and meet the government's objectives in the energy sector:

a. Strengthen policy design, investment planning, and coordination.

Key state agencies responsible for energy policy development and design and the oversight of investment—members of the Electricity Management Committee (EMC)—should take the lead in this area. It is recommended that the EMC adopt a national power sector master plan with investments ranked on the basis of the least-cost plan. The NEROP implementation plan should be incorporated into the national power development plan.

b. Introduce the competitive selection of investment projects.

All power infrastructure investments should be procured through an open competitive tendering and selection process in accordance with the least-cost plan. Unsolicited proposals should not be permitted.

c. Base the power infrastructure on cost recovery for long-term effectiveness.

This will mean introducing a cost recovery tariff and periodic cost-of-service assessments and tariff reviews. State proponents will need to ensure that affordability and attracting private investment are adequately addressed.

d. Introduce a tiered definition of electrification and review technical standards and service standards for electrification.

The adoption of tiered defined electrification means assessing the appropriate type of technical solution for each situation. This would allow cost-saving options for electrification. In this connection, it is important to strengthen the capacity and resourcing of the Energy Wing of DPE to facilitate policy development and administration.

e. Introduce good sectoral and corporate governance and accountability.

The power sector must—and must be seen to—operate openly and transparently, aspiring to good governance and accountability. Shielding the sector from political interference, appointing a professional board, introducing key performance indicators, and mandating information disclosure and accountability measures will be essential.

f. Improve PPL's operational and financial performance.

Focus on a short-term turnaround of PPL's operational and financial performance through actions in the areas of skilled corporate management, management support systems, physical infrastructure, reduction in service costs, and enhanced revenue recovery.

g. Develop dedicated institutions and teams for national electrification that have clear roles and mandates and are held accountable for results.

It is important to foster collaboration and consultation among and between key state agencies, including provincial and local-level service monitoring authorities, to address cross-cutting issues.

h. Fully engage the private sector in projects.

State agencies should create more opportunities to develop the experience and confidence to facilitate greater private sector participation in the energy sector—participation secured through an open and transparent competitive tendering process.

i. Integrate social and environmental safeguards in project evaluation and implementation.

All projects must observe and comply with Papua New Guinea’s legal and regulatory requirements related to conservation and environmental protection, as well as with international standards for environmental and social safeguards. Communities should be engaged up front, from the project identification stage. For households with affordability challenges, it would be important to provide financing mechanisms and/or transparent subsidies or cross-subsidies.

3.2 Transport sector

162. **The following priority actions are recommended to address challenges in the transport sector:**

a. Sustain commitment to high-level national policy and the supporting transport sector investment plans

Policy design, investment planning, and coordination for the transport sector are at the forefront of Papua New Guinea’s national planning and development partner coordination, as is reflected in the NTS, MITPs, the NRNS, and the Connect PNG investment program. It is important to monitor that subsequent iterations of transport policy and investment planning are consistent with national-level objectives to improve infrastructure with sustainable and disaster-resilient quality to provide a more enabling environment for the growth of the economy and for the improvement of service delivery. Moreover, strong coordination mechanisms, such as the high-level program steering committee for Connect PNG and the Transport Sector Coordination, Monitoring and Implementation Committee, should continue to coordinate policy and investment in the sector among key departments and development partners active in the sector. These policies and objectives should ensure improved access to transport infrastructure for the population.

b. Explore cost recovery mechanisms and optimize the use of limited resources through appropriate road maintenance modalities

A reliable and regular source of adequate recurrent funding needs to be established for DoW to maintain its growing list of assets effectively. The costs of repairing road damage should be recovered from users in proportion to the damage they cause. It is expected that the charges imposed on road users and consumers will be fully offset by the savings they will gain from reduced vehicle operating costs from using the road.

Better incentives are required for DoW’s contractors to deliver value for money and lifecycle efficiency of DoW assets. Under current institutional arrangements, numerous single-year, input-based contracts provide few incentives for contractors to provide value for money or lifecycle efficiency. Instead, they encourage cost-cutting and lower-quality delivery. The absence of reliable year-to-year budget funding reinforces the short-term view. Shifting from year-to-year, input-based delivery to longer-term output/performance contracts would provide contractors with better incentives to deliver higher-quality work and ensure that DoW’s road assets meet their lifecycle requirements.

c. Strengthen enforcement of vehicle regulations to improve safety and reduce premature deterioration of transport infrastructure

RTA's capacity requires strengthening to effectively regulate against overloaded vehicles, unsafe driving, and unsafe vehicles, thus reducing the cost of road maintenance, rehabilitation, and operations, as well as the heavy economic toll of road crashes and associated casualties. Papua New Guinea's road safety statistics are outdated and need to be continuously monitored if any meaningful response is to be designed.

d. Maintain the balance between infrastructure investment and maintenance

Investment plans should be consistent with having adequate resources available for O&M. On the policy front, the NRNS—with its “maintenance first” policy—strikes a good balance between capital development and maintenance. Deferred maintenance will result in higher road network rehabilitation costs. Therefore, the government is advised to continue prioritizing the optimal use of resources, including maintaining the existing network, mobilizing financing for maintenance (including through road user charges and levies), and making strategic use of concessional financing for new capital projects. Increased funding for maintenance of the national highway network is essential.

e. Introduce private sector participation where appropriate

Stakeholders active in the roads subsector widely accept that there is limited opportunity for PPPs (for example, through the introduction of toll roads or finance-and-build arrangements using private lending). The government has stated through the NTS that PPPs are likely to be more costly than sovereign loans from development partners and may create conflicts in combining borrowing obligations with contract delivery. Nevertheless, the introduction of longer-term output/performance-based maintenance contracts can give greater certainty to the private sector and could improve private sector ownership over maintaining the road network to an acceptable standard.

f. Extend capacity-building support to provincial governments

While there is clear direction and mandate on the responsibility for the national road network, ambiguity remains on the management of the provincial/district network. For the subnational network, consistent technical standards must be applied for design and construction, network integration, economic analysis, and value for money. In addition, responsibilities for maintenance and asset management must be clearly defined. Despite the push to decentralize responsibility for the subnational network to provincial and district-level governments, capacity constraints will require continued support from development partners (including in road and bridge asset management) and from DoW to ensure that the implementation of standards remains as consistent as possible with national-level standards.

g. Prepare COVID-19-ready projects

COVID-19 introduces new challenges in the development of transport infrastructure and transport service provision in Papua New Guinea. The infrastructure projects and programs implemented by development partners have generally focused on making communities and contractors aware of communicable diseases such as HIV/AIDS and sexually transmitted infections, and how to prevent their spread. Now rigorous awareness programs need to be developed to ensure that communities and contractors practice measures—quarantine/self-isolation, good hygiene, and social distancing—that will reduce the spread of COVID-19.

3.3 Water, sanitation, and hygiene sector

163. **The following priority actions are recommended to address challenges in the WaSH sector:**

a. Strengthen policy design, investment planning, and coordination

Sector regulation. Resolve any issues regarding the draft NWSHA Bill, obtain Parliamentary approval, and enact the new law, to establish a strong and long-lasting institutional home for the water sector. Then formally establish the NWSHA, appoint the NWSHA Board and CEO, and increase the number of staff.

WaSH planning and budgeting. Resolve any outstanding issues regarding the WaSH Strategic Plan, discuss with stakeholders as necessary, and obtain formal approval from the NWSHA Board. Ensure that indicative funding for WaSH investments is included in the next MTDP. Prepare and obtain approval for the first National WaSH Sector Annual Workplan and Budget.

WaSH service delivery in rural areas. Evaluate preparation of, and review, District Development Plans in pilot districts; coordinate funding and clarify budget allocation and financing mechanisms. Support implementation of the pilot plans. Update the WaSH Operation Manual with procedures, approaches, and guidelines for rural WaSH. Develop a pipeline of rural WaSH projects for funding and implementation.

WaSH service delivery for urban areas. Develop a pipeline of urban WaSH projects with a focus on extending WaSH service coverage in urban areas, including to peri-urban areas, informal settlements, and smaller provincial and district towns. Coordinate funding and clarify budget allocation and financing mechanisms. Operationalize the CSO Policy for urban WaSH and optimize the service delivery model in district towns. Develop a programmatic approach to infrastructure expansion and water resources identification.

b. Advance reforms, ensure good governance and accountability

Capacity development. Prepare and implement a Capacity Development Plan for the WaSH sector. Establish formal partnerships with universities and educational institutions for training and educating staff for the WaSH sector.

Monitoring. Further develop, operationalize, and implement M-Water as a data collection and monitoring system for the WaSH Sector.

c. Provide a better balance between infrastructure investment and maintenance

Operations and maintenance. Water PNG needs to develop models for the efficient delivery of WaSH services to small towns in PNG without losing money.

Finance. Strongly increase public funding for WaSH and improve funding mechanisms both for capital investments and O&M, making use of the DDA service delivery mechanism with the support and coordination of NWSHA.

d. Introduce greater private sector participation and funding diversification

Finance. As public funding for WaSH will be insufficient for achieving Papua New Guinea's WaSH goals, water utilities need to improve their creditworthiness to access private capital for financing WaSH infrastructure. Encourage private sector participation to strengthen services (for example, through tax credits and corporate social responsibility programs).

e. Integrate social and environmental concerns in project evaluation

Climate change. Per Papua New Guinea’s 2015 WaSH policy, technology choices must consider environmental sustainability and be robust to the short- and long-term anticipated effects of climate change.

Civil society participation. Strengthen the involvement of civil society in the planning, preparation, and implementation of WaSH projects, with an emphasis on strengthening the role of women and disabled persons.

f. Prepare COVID-19-ready projects

Safely managed WaSH services are an essential part of preventing and protecting human health during infectious disease outbreaks, including the current COVID-19 pandemic. Given the very low access to safe water and sanitation facilities, three priority areas can be considered for both containing the virus and lowering its immediate impact and aftermath: (i) providing safe WaSH services in health care facilities to protect patients, health workers, and staff, and prevent further transmission; (ii) improving handwashing behavior, food hygiene, and safe water practices; and (iii) providing emergency support to service providers to prepare emergency plans and ensure continuity of service delivery, and extending rapid and low-cost service provision for communities.

3.4. ICT sector

164. **A new entrant presents an opportunity for Papua New Guinea** to strengthen telecom sector performance by reorganizing, strengthening, and privatizing SOEs; improving the performance of PNG DataCo (or allowing competition in data wholesaling); completing regulatory work to encourage competition; and developing platforms for online education and e-health.

a. Reorganizing, improving, and privatizing existing SOEs to improve performance

To improve the performance of the ICT sector, the government should reorganize and improve SOEs to allow for greater private sector participation. In their present state, KTH’s holdings are unlikely to attract investor interest. The Minister for State Enterprises, Sasindran Muthuvel, has expressed support for this view. Of KCH generally, he has said:

We are open to the idea of partial privatization...however, to attract concessional funding and private capital we need to clean our books and bring the financials up to date...These organizations have been running like a government department for a very long period of time. So we need to bring in a corporate culture, to make them realize this is purely business. The agenda is to restructure those loans and also to refinance ... with some concessional loans.⁷¹

In the telecommunications sector, Minister Muthuvel has expressed more concrete ideas about his views on privatization:

The government is considering a few options regarding Kumul Telikom and the companies that fall within it—Telikom PNG, bmobile, PNG DataCo, EMTV, and PNGFM. I don’t want to preempt what we are doing ... but we are very, very open to the idea of privatization.... If someone tomorrow comes with US\$300 million (PGK 1 billion) to take over the company, we are open to consider it, as long as we are still going to be part of it, and we can ensure that the services will continue to flow.⁷²

⁷¹ Business Advantage PNG. 2020. “Privatisation on the agenda for Papua New Guinea’s state-owned enterprises?” February 24.

⁷² Ibid.

b. Improving the performance of PNG DataCo or allowing competition in data wholesaling

Consultation with ISPs has raised several serious concerns about the quality of the wholesale service provided by PNG DataCo. There is an active dispute over access to the Coral Sea Cable.⁷³ One ISP consulted estimated that data flowing over the Coral Sea Cable is of reduced quality 90 percent of the time because of mismanagement of the cable termination. Specifically, ISPs consulted cited problems in the procurement and installation of SFP modules that have led to delays, cost overruns, and reduced quality in delivering the enhanced data speeds and capacity promised by the Coral Sea Cable. ISPs consulted raised concerns that PNG DataCo does not have the technical skills required to deliver required services, and is reluctant to take the steps necessary to improve service.⁷⁴

To improve the performance in wholesale ICT services, KCH should allow private sector participation in PNG DataCo. This could take the form of bringing external private investors on board or engaging external experts with real technical expertise in a management contract to improve the performance of PNG DataCo. If KCH is unwilling to allow private sector participation in PNG DataCo, then NICTA should consider encouraging a new entrant to compete with PNG DataCo in the wholesale market. Alternatively, NICTA could order unbundling of PNG DataCo and allow private operators to purchase IRUs/dark fiber on the Coral Sea Cable, which they would then wholesale to retailers such as ISPs.

c. Complete regulatory work to encourage greater competition



Regulations to allow for greater competition in the mobile market are not yet complete. For a reformed and recapitalized bmobile, a privatized bmobile, or the new entrant to be able to successfully compete with Digicel, tower sharing, passive infrastructure sharing, and number portability will all be key to gaining a foothold in the market. Therefore, it is recommended that NICTA allow tower sharing and passive infrastructure sharing, and—when the time is right—allow number portability.

d. Develop platforms for online education and e-health services that will drive demand

It is recommended that the government develop better platforms for e-education and e-health services to make full use of the new capacity delivered by the Coral Sea Cable. Bmobile and NICTA both expressed a desire to see more done in these sectors. Moreover, they believe that well-designed platforms will drive demand for ICT services as more users attend class or see a physician electronically. Finally, these uses of ICT services have broader societal benefits and fit neatly within the government's policy goals expressed in Vision 2050, the Medium-Term Development Plan 2018–22, and the Draft National Broadband Policy. A digital identification platform will also be critical for users to identify themselves online and access digital services.

⁷³ Kila Gulo-Vui (Director of Economics, Consumer, and International Affairs at NICTA) during stakeholder consultation conducted via teleconference, May 13, 2020.

⁷⁴ Confidential Consultation with PNG based Internet Services Provider conducted via teleconference. May 8, 2020.



Annexes

Annex 1. Selected Economic and Social Indicators

	2015	2016	2017	2018	2019	2020	2021	2022
					Est.	Projections		
National income and prices <i>(In percent, unless otherwise indicated)</i>								
Nominal GDP (US\$ billions)	21.7	20.8	22.7	23.4	25.0	23.0	24.2	24.5
Real GDP growth, <i>of which</i> :	9.5	4.1	3.5	-0.8	6.0	-1.3	3.4	3.0
Extractive sector (percentage point contribution)	12.8	2.4	1.9	-2.9	4.3	-1.6	1.5	0.6
Non-extractive (percentage point contribution)	-3.3	1.7	1.7	2.2	1.7	0.3	2.0	2.4
Consumer price inflation, period average	6.0	6.7	5.4	4.7	3.6	3.2	3.5	4.0
GDP deflator	-3.9	3.9	7.7	7.2	3.7	-2.0	8.4	4.6
Real exchange rate change, US\$/PGK*	-5.9	-6.9	1.4	-1.0	-1.5	-3.6	-4.9	-4.2
Fiscal accounts <i>(In percent of GDP, unless otherwise indicated)</i>								
Revenue and grants	18.3	16.1	15.9	18.3	16.4	16.2	16.3	16.8
Non-resource tax revenue	14.9	12.8	12.4	12.6	12.0	12.2	12.3	12.9
Resource revenue	1.1	0.6	0.9	1.9	1.3	1.0	1.3	1.3
Grants and other revenue	2.3	2.7	2.5	3.8	3.0	3.0	2.7	2.7
Expenditure and net lending	22.4	20.9	18.4	20.9	21.3	22.6	20.1	19.8
Primary expenditure	20.6	18.9	16.1	18.4	18.7	20.0	17.7	17.5
Interest payments	1.8	1.9	2.3	2.5	2.5	2.6	2.4	2.3
Overall fiscal balance	-4.1	-4.7	-2.5	-2.7	-4.9	-6.4	-3.8	-2.9
Non-resource primary balance (% non-extractive GDP)	-4.5	-4.5	-1.6	-2.7	-5.3	-6.3	-3.7	-2.7
Net public debt	30.7	34.6	35.9	37.7	39.2	47.0	46.5	47.5
Gross government debt and guarantees	30.7	34.6	35.9	39.3	39.7	47.0	46.5	47.5
Gross government savings	0.0	0.0	0.0	1.6	0.5	0.0	0.0	0.0
External accounts <i>(In millions of U.S. dollars, unless otherwise indicated)</i>								
Exports, f.o.b., <i>of which</i> :	8,425	8,202	9,958	10,504	11,389	9,083	10,504	10,757
Extractive sector	7,199	6,730	8,335	8,862	9,965	7,700	9,103	9,312
Imports, c.i.f.	-2,559	-2,077	-3,066	-3,519	-3,677	-3,639	-3,816	-4,052
Current account	4,561	5,287	5,401	5,676	5,682	3,479	3,820	2,703
(in percent of GDP)	21.0	25.5	23.7	24.2	22.7	15.1	15.8	11.0
Overall balance of payments	-440	-184	36	517	101	-485	403	790
Gross official reserves	1,865	1,681	1,717	2,235	2,335	1,850	2,253	3,043
(in months of goods and services imports)	7.1	4.3	4.0	5.1	5.1	3.4	3.4	3.9
(in months of non-extractive imports)	24.4	12.0	8.6	10.7	11.5	9.1	11.0	13.8
Money and credit <i>(In percent, unless otherwise indicated)</i>								
Broad money growth	8.0	10.9	-0.9	-3.8	9.6	0.6	8.0	9.2
Domestic credit growth	15.8	24.6	-0.1	-7.9	12.7	6.3	6.2	6.9
Growth of credit to the private sector	3.4	7.2	-3.8	7.4	10.5	2.9	3.2	6.0
Interest rate of 182-day T-bills, period average	7.1	7.4	7.1	7.0	6.5	4.8	4.5	5.7
Social indicators								
Population, total (millions)	8.1	8.3	8.4	8.6	8.8	8.9	9.1	9.3
Population growth (percent)	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9
Life expectancy at birth (years)	65.4	65.5	65.7	65.9

Sources: Official historical data; World Bank staff estimates and projections.

Note: * An increase represents appreciation and a decrease is depreciation.



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