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PAPUA NEW GUINEA ECONOMIC UPDATE JULY 2019

# Recovery Amid Uncertainty

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***Recovery Amid Uncertainty***

July 2019

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## Preface and Acknowledgements

This publication is the third in a new 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 Papua New Guinea'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 policymakers, 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), Marcello Estevao (Global Director), Ndiame Diop (Practice Manager), and Patricia Veevers-Carter (Country Manager). The core economic team comprises Ilyas Sarsenov, John Grinyer, and Anthony Obeyesekere. The team would like to acknowledge contributions provided by Ekaterine Vashakmadze and Wilfred Lus. The special focus section on food security and agriculture development was prepared by Dr. Dan Vadnjal, with inputs and supervision provided by Allan Tobalbal Oliver. Michelle Lee and Rachel Leka provided administrative support. Bronwen Brown edited the text. Dissemination is organized by Tom Perry, Hamish Wyatt, and Lydia Kaia.

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## Abbreviations and Acronyms

| | |
|---|---|
| APEC | Asia-Pacific Economic Cooperation |
| BPNG | Bank of Papua New Guinea |
| CB | Cocoa Board |
| CBB | Coffee berry borer |
| CIC | Coffee Industry Corporation |
| CPI | Consumer Price Index |
| DAL | Department of Agriculture and Livestock |
| DSA | Debt Sustainability Analysis |
| EMDEs | Emerging Markets and Developing Economies |
| EITI | Extractive Industries Transparency Initiative |
| FBO | Final Budget Outcome |
| FER | Functional and Expenditure Review |
| FPDA | Fresh Produce Development Agency |
| FX | Foreign currency |
| HACCP | Hazard Analysis and Critical Control Points |
| IMF | International Monetary Fund |
| K or PGK | Kina |
| KFR | Kina facility rate |
| KIK | Kokonas Indastri Koporesen |
| LNG | Liquefied natural gas |
| MMBtu | Million Metric British thermal units |
| MRDC | Mineral Resources Development Company |
| MTDP | Medium-Term Development Plan |
| MTFS | Medium-Term Fiscal Strategy |
| MTRS | Medium-Term Revenue Strategy |
| Mtpa | Million tons per annum |
| NEER | Nominal Effective Exchange Rate |
| NRPB | Non-resource primary balance |
| NSL | Nambawan Super Limited |
| OPIC | Oil Palm Industry Corporation |
| OSPEAC | Organisational Staffing and Personnel Emolument Audit Committee |
| PACD | Agriculture Commercialization and Diversification Project |
| PHAMA | Pacific Horticulture and Market Access |
| PFL | Paradise Foods Limited |
| PMMR | Public Money Management Regularisation |
| PNG | Papua New Guinea |
| PNG EU | Papua New Guinea Economic Update |
| PNG LNG | Papua New Guinea Liquefied Natural Gas Project |
| PPAP | Productive Partnerships in Agriculture Project |
| REER | Real effective exchange rate |
| StaRS | Strategy for Responsible Sustainable Development |
| T-bills | Treasury bills |
| US$ | United States Dollars |

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# Executive summary

## Economic Update and Special Focus

## A. Economic Update: *Recovery Amid Uncertainty*

**Papua New Guinea's economy has started recovering from a series of external shocks, but its growth outlook remains fragile due to rising uncertainties.** The recovery is being observed in the resource sector, mainly in its extractive segment dominated by liquefied natural gas (LNG),[1] while growth in the non-resource economy remains subdued due to sluggish domestic demand. Real GDP growth dropped gradually from 13.5 percent in 2014 to a contraction of 0.5 percent in 2018 (Table 1), following the end of the LNG-led construction boom by 2014, the commodity-price shock and a negative El Niño impact in 2014–16, and a 7.5-magnitude earthquake that led to a temporary production shutdown in the extractive sector in the first half of 2018. Real GDP growth is forecast to jump to about 5.6 percent in 2019, following a recovery in extractive-sector production, and hover between 3.1-3.5 percent in 2020–21, supported by proposed investments in several large resource projects. This outlook is subject to downside risks ranging from the domestic political economy to the recent escalation of trade tensions between the United States and China.

**Table 1. Real GDP Growth and Its Key Components**
(Percentage change)

| | 2014 | 2015 | 2016 | 2017 Est. | 2018 Est. | 2019 Projections | 2020 Projections | 2021 Projections |
|---|---|---|---|---|---|---|---|---|
| Gross Domestic Product (GDP) | 13.5 | 9.5 | 4.1 | 2.7 | -0.5 | 5.6 | 3.1 | 3.5 |
| Resource sector | 32.5 | 32.0 | 6.8 | 4.0 | -4.5 | 10.0 | 2.8 | 2.3 |
| Extractive sector (non-renewable) | 73.9 | 61.2 | 9.8 | 5.7 | -9.6 | 14.1 | 2.2 | 1.8 |
| Agriculture, forestry, and fishery (renewable) | 3.4 | -2.6 | 2.7 | 1.8 | 3.3 | 3.7 | 3.6 | 3.0 |
| Non-resource economy | 1.2 | -4.2 | 3.2 | 0.5 | 2.5 | 2.2 | 3.3 | 4.4 |

*Sources:* National Statistical Office; World Bank staff estimates and projections.

**The authorities' response to external shocks has led to mixed results and will require adjustments.** The successful placement of a US$500 million 10-year sovereign bond and the attraction of bilateral and multilateral budget-support loans has created some breathing space for both government and businesses since late-2018, allowing some of the foreign currency backlog to be cleared and imports to resume in the first half of 2019. However, these gains are at risk of being lost if the authorities do not return to the earlier-adopted fiscal-consolidation path and refocus on establishing a more flexible exchange rate regime. The central bank focused on strengthening monetary policy and addressing the backlog of foreign exchange orders, while the exchange rate adjustment has slowed. The fiscal policy stance became expansionary in 2018–19, following higher revenue from the resource sector and higher government spending (compared to the low base of 2017). The 2018 public expenditure saw a large unbudgeted increase in the government wage bill (personnel emoluments); if this continues, it risks undermining the positive efforts the authorities have made to stabilize public finances and the macroeconomy. A reinvigorated fiscal consolidation strategy requires mobilizing non-resource revenue, instituting fiscal discipline over the public-sector wage bill, and raising efficiency in public investment.

**A longer-term government agenda of building an inclusive and sustainable economy would require a focus on structural reforms.** The current Medium-Term Development Plan for 2018–22 (MTDP III) lays out a comprehensive strategy for delivering on the country's development aspirations over the next half-decade. The MTDP III focuses on developing physical and human capital and strengthening governance and institutions, as the most critical cross-cutting areas for development. It also looks at sector-specific issues and identifies a set of implementation actions for each priority sector. Agriculture is one of the priority sectors due to its large share of the economy and the vast population living in rural areas that is involved in subsistence and cash income agriculture. To realize the potential of agriculture as a source of income and job creation, the authorities should consider policy options and responses that will secure sustainable rural livelihoods in food and agriculture, as discussed in detail in Part B.

[1] The share of the resource sector in GDP at factor cost increased from about 34 percent in 2013 to over 46 percent in 2018. The resource sector comprises *renewable* agriculture, forestry, and fishery (18.4 percent of GDP estimated for 2018) and *non-renewable* mining, quarrying, and oil and gas extraction (28 percent of GDP). Crude oil and LNG account for two-thirds of the extractive sector. Exports of agricultural, forestry, and marine products is estimated to account for 14 percent of merchandise exports in 2018, while extractive sector exports accounted for over 84 percent.

## B. Special Focus: *Securing Sustainable Rural Livelihoods in Food and Agriculture*

**The livelihoods of millions of Papua New Guineans depend on subsistence and cash income agriculture.** Around 87 percent of Papua New Guineans live in rural areas, and 75 percent of these are engaged in a variety of subsistence and cash income agriculture activities. Staple products are the main source of subsistence, provide food energy and protein, and are a source of food security for rural villagers when income-earning opportunities are limited. Cash income agriculture includes primary products such as fresh foods and export products like coffee, cocoa, palm oil, and copra and copra oil. While most rural villagers combine these traditional subsistence and cash income activities, there is a small but increasing number producing value-added products such as high-value coconut products and spices. A broad policy consensus exists in the sector on the need to focus on both subsistence and cash income agriculture activities as articulated in the MTDP III.

**Tackling constraints and boosting cash income activities through partnerships will contribute to securing sustainable rural livelihoods.** Myriad obstacles impact agricultural activity in Papua New Guinea. A lack of transport infrastructure tends to have more of an impact on perishable (compared with non-perishables) products such as fresh food. Limited financial services are, in general, a constraint while access to finance is more challenging where significant financial investments are required. Extension services are mixed, tending to favor export products, while rural villagers engaged in other cash income and subsistence activities tend to miss out. Limited market access and marketing services are a challenge, especially for local producers of value-added products for sale in the domestic market. There are other threats, from climate change and a general lack of law and order. An innovative response to some of the major constraints facing rural villagers has come from introducing supply-chain partnership models which provide a platform for support to high-value coconut products, spices, small livestock, coffee, and cocoa. By building partnerships between the private and public sectors, these programs leverage technical and financial resources, expand the possibilities for cost sharing on service delivery, and provide rural villagers with access to markets.

**The authorities should focus on improving cooperation and institutional capacity and providing innovative policy solutions.** There is a broad understanding of the institutional and policy shortcomings hampering agriculture sector performance. The Productive Partnerships in Agriculture Project (PPAP) and its follow-on Agriculture Commercialization and Diversification Project (PACD), along with the other similar approaches applied by the development partners, provide innovative solutions through partnerships between the public and private sector. For the future, authorities should encourage this mode of delivery for cash income activities, including export, value-added, and primary products such as fresh foods, and consider extending this to subsistence activities. The focus on delivery support to subsistence and cash income agriculture activities is important, not only because it provides rural villagers with alternative sources of income; it also provides food security when cash income activities are limited. Inevitably, institutional cooperation and capacity building—involving both the public and private sectors as well as civil society and non-governmental organizations—will not only be effective (by impacting rural livelihoods) and efficient (by reducing delivery costs), it will also ensure a wider distribution of the benefits for rural villagers.

Part A

# Economic update

## Recovery Amid Uncertainty

The return to full production in the extractive sector is boosting Papua New Guinea's economic growth in 2019. Photo: Wilfred Lus.

# 1. Recent economic developments

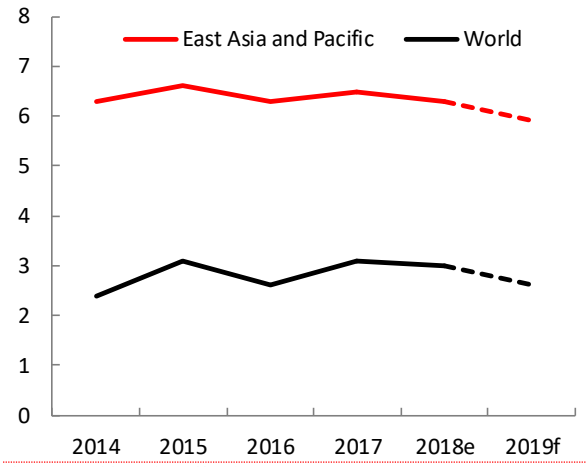
## *1.1. Economic growth*

1. **Global economic growth remains fragile, with downside risks dominating the short-term outlook.** The less optimistic view of global economic growth is the result of recently-renewed trade tensions among major economies and an observed decline in investor sentiment worldwide.[2] The recent volatility in global equity prices and a weakening in global trade performance in the first half of 2019 underscores this fragility. Investment growth continues to be on a downward trend, and it has been declining in commodity-exporting economies. Overall, global GDP growth is expected to decline from an annual rate of 3 percent in 2018 to 2.6 percent in 2019. Meanwhile, average annual economic growth in the East Asia and Pacific region is decelerating to below 6 percent (Figure 1).[3] There are potential negative implications for Papua New Guinea's economy should external demand for its exports soften.

2. **The short-term economic growth prospects of Papua New Guinea's major trading partners—Australia, China, and Japan—are generally deteriorating.** Growth in Australia fell to a decade-low level of 1.8 percent in the first quarter of 2019,[4] while growth in Japan is forecast to plateau at about 0.8 percent in 2019. While China's annual GDP growth rate is moderating toward 6 percent per year, the Chinese economy is still, by far, the primary source of growth in the region. The Chinese economy is forecast to grow in nominal terms by about US$1.2 trillion in 2019, far more than any of Papua New Guinea's other key trading partners (Figure 2).

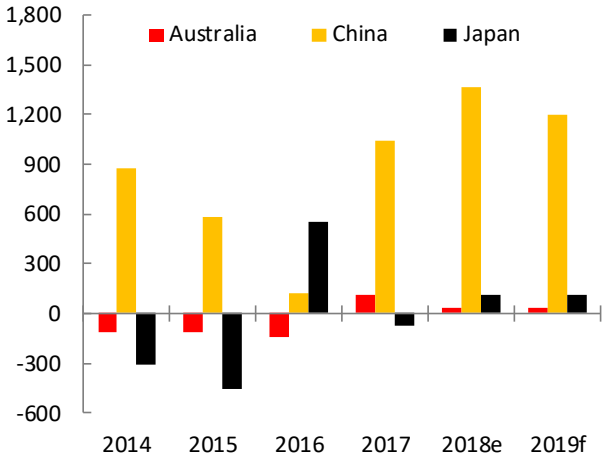
[2] World Bank 2019f (see Special Focus 1.1 "Investment: Subdued Prospects, Strong Needs").
[3] World Bank 2019b.
[4] Financial Times 2019.

**Figure 1. Global and regional growth rates continue to moderate**
(Average annual percent change in real GDP)




*Source:* World Bank staff estimates.

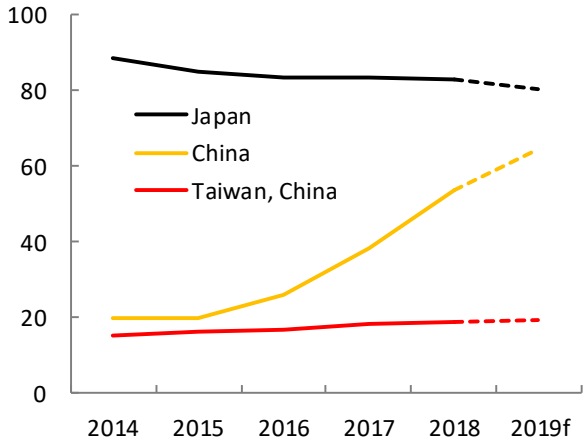
**Figure 2. China remains the primary source of income growth among key regional trading partners**
(US$, billions)




*Sources:* World Development Indicators; World Bank staff estimates.

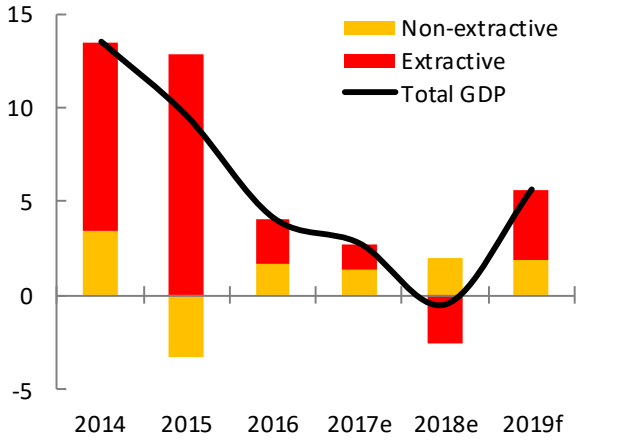
3. **Rising demand for Papua New Guinea's main commodity export, liquefied natural gas, gives cause for optimism.** Moves to improve air quality in Chinese cities, coupled with China's continued economic expansion, are driving steady increases in Chinese demand for natural gas. With domestic Chinese supply unable to keep pace with demand, LNG imports are rising rapidly (Figure 3) and exceeded 50 million tons per year in 2018 (more than five times Papua New Guinea's total annual LNG production). Japan, the world's largest importer of LNG, took steps in 2011 to reduce the use of nuclear power and saw an increase in LNG imports which has proved sustainable in recent years but is likely to decline as its nuclear plants come back on-line. Demand for LNG in Taiwan, China—Papua New Guinea's third largest LNG trade partner—rose by an average of 5 percent per year in 2012–18, supporting the outlook of growing regional demand over the medium term (Box 1).

**Figure 3. Japan is the largest LNG importer, but China is rapidly catching up**
(Tons, millions)




*Sources:* World Bank staff estimates; UN Comtrade database.

**Figure 4. PNG's GDP growth performance has been volatile due to external shocks**
(Percentage point contribution to growth)




*Sources:* National Statistical Office; World Bank staff estimates.

4. **Following an earthquake in February 2018, which negatively impacted extractive sector output, real GDP growth bottomed-out in Papua New Guinea.** Our revised estimates for 2018 suggest that real GDP contracted by 0.5 percent, compared to our initial assessment of 0.3 percent growth, reflecting a more substantial decline in mining sector output than initially envisaged.[5] Official updates to GDP estimates for 2014–16 also contributed to the GDP growth re-estimation.[6] Consequently, our GDP growth forecast for 2019 has been revised upwards, to 5.6 percent (from 5.1 percent previously). The extractive sector is projected to contribute 3.8 percentage points to total GDP growth in 2019, while the non-extractive sector's contribution will be slightly lower than in 2018 (Figure 4).

5. **While the extractive sector has started to recover, growth in the non-extractive economy remains subdued due to sluggish domestic demand.**[7]

- Export volumes of palm oil, Papua New Guinea's most important crop, fell by 1.2 percent in 2018, while cocoa and coffee exports rose by 4.4 and 9.1 percent, respectively, driven by a strong performance in the second half of the year. Logging exports rose modestly in 2018 (by 1.1 percent).
- The employment picture is little changed from our previous PNG EU, with survey information suggesting a 2 percent decline in formal private sector employment in 2018.[8] As detailed in the next sub-section, public sector employment continues to rise, with about 5,000 new hires in 2018, including teachers, health workers, and security personnel.
- Credit from domestic banks to the non-extractive economy contracted by 0.6 percent in 2018, suggesting that credit continued to decline as a share of non-extractive GDP. Lending to some non-extractive sectors rose in 2018—credit to agriculture rose by 31 percent, and to 'other business' (which includes computing, legal, consultancy, and other services) by 19 percent, pointing to an increase in investment in these sectors. However, this growth was more than offset by declines in lending to manufacturing, finance, and transport and communications.
- Construction sector growth for 2018 is estimated at a modest 2 percent. While information on this sector is patchy, the sharp falls in construction sector employment (11 percent in 2018) suggest a slow-down, while 5 percent credit growth to the building and construction sector and a 17 percent increase in mortgage lending would indicate that the sector's performance may be set to improve. There was a modest acceleration in government-funded construction spending in 2018, which increased by 10 percent (K 130 million, US$38.5 million) compared with 2017. However, this increase is less than 0.2 percent of GDP and is, therefore, unlikely to have a significant impact on the sector.

Overall, we have revised down our estimate for 2018 non-extractive sector growth from 3 to 2.8 percent. We anticipate a lower rate of growth in the non-extractive economy in 2019 as the last year's exceptional demand, driven by events of the Asia-Pacific Economic Cooperation (APEC), has faded out.

6. **Government spending is driving growth in the services sector.** Increases in teacher, health worker, and security sector employment levels directly contributed to GDP growth while higher spending on goods, services, and investment filtered into other parts of the services sector. With the 2019 government budget being, on paper, only slightly expansionary, we do not expect that government spending will fuel a significant

[5] Basil 2019a; PNG MRA 2019.
[6] The National Statistical Office released the updated National Accounts' estimates for 2009–16 in April 2019, with substantial revisions made to the years after 2013 (PNG NSO 2019c).
[7] Hard data on the non-extractive economy is not available for 2019, making a discussion of recent developments challenging.
[8] Formal sector employment accounts for roughly 16 percent of all employment (Jones and McGavin 2015); data on developments in informal employment are not available.

increase in non-extractive sector growth in 2019. However, as discussed in Box 2, if the government continues to overspend, this may provide a temporary boost to GDP for the year.

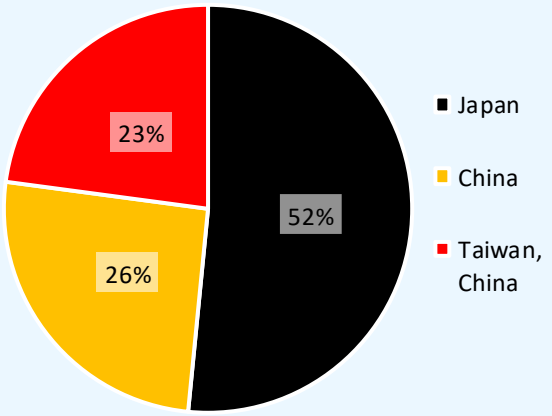
## Box 1. Which economies buy liquefied natural gas from Papua New Guinea?

***LNG supply and demand in east Asia***

With liquefied natural gas (LNG) production accounting for about 13 percent of GDP and nearly 40 percent of merchandise exports, LNG is now a firmly-established feature of Papua New Guinea's economy. But which economies buy this gas, and how does Papua New Guinea compare to other LNG exporters in the region?

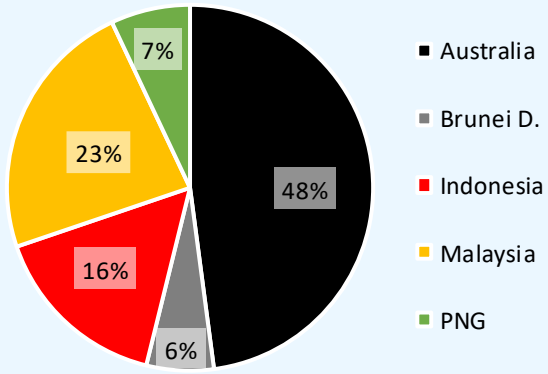
Looking at 2017 as a base year to sidestep the disruption caused by the February 2018 earthquake, we see Japan was the largest purchaser of natural gas from Papua New Guinea, importing 4.2 million tons, followed by China (2.1 million tons) and Taiwan, China (1.9 million tons). Taiwan, China, is the most dependent on gas from Papua New Guinea, with 10.4 percent of its LNG imports coming from the country; in China the number is 6.1 percent, and 5.1 percent for Japan.

**Figure 5. Purchasers of PNG's LNG, 2017**
(Share of total)




*Source:* UN Comtrade database and national statistics.

**Figure 6. Asia-Pacific LNG Exports, 2017**
(Share of total)




*Source:* International Group of LNG Importers.

Papua New Guinea is still a minor producer by global standards. Its 8.2 million tons of LNG exports is dwarfed by the 81 million tons exported annually by Qatar, the world's largest LNG exporter. In the Asia-Pacific region, Papua New Guinea ranks fourth behind Australia, Malaysia, and Indonesia. However, if the new Papua LNG project and the PNG LNG expansion (P'nyang) deliver the promised 8 million tons of extra capacity, Papua New Guinea will potentially move closer to Indonesia.


**The 2019 National Budget set a higher bar for public investment, undermining the fiscal consolidation agenda. Photo: Adel Sarsenova.**

### *1.2. Fiscal developments*

7. **The 2018 Final Budget Outcome (FBO)[9] saw both revenues and expenditures exceed their budget targets.** The 2018 budget recorded an overall fiscal deficit of 2.7 percent of GDP (K 2 billion), slightly above the initial budget target of 2.5 percent of GDP. Strong revenue performance was driven by mining and petroleum taxes and dividends and higher development-partner grant receipts following the earthquake, while overspending was the result of a substantial increase in wage and salary payments. The non-resource primary balance (NRPB) registered a deficit of 2.7 percent of non-extractive GDP in 2018 (wider than the budgeted deficit of 1 percent of non-extractive GDP). The NRPB considers non-resource revenues and primary expenditures and measures the extent to which Papua New Guinea's public finances are sustainable without revenues from non-renewable resources. Under the Medium-Term Fiscal Strategy (MTFS) the NRPB is targeted to reach a zero balance by 2021–22, the point at which public finances can be considered 'sustainable' (this is currently not the case). The deterioration of the NRPB in 2018 was mainly the result of an increase in uncontrolled recurrent spending (chiefly, the government wage bill).

8. **Judging government performance against the MTFS shows a mixed picture, with improvements recorded in three of the six performance targets.** As detailed in Table 2, improvements were observed in the revenue, NRPB, and public investment criteria, while the performance of the three

[9] PNG Treasury 2019.

remaining items either deteriorated or registered no progress. Government spending bounced back to about 21 percent of GDP in 2018, while net public debt is estimated to have reached 34.2 percent of GDP. This figure is lower than that published in our previous PNG EU; the adjustment is due to the upward revision of Papua New Guinea's GDP numbers by the National Statistical Office in April 2019.[10] This revision suggests that debt levels now fall within the 35 percent ceiling imposed by the Fiscal Responsibility Act.

**Table 2. Medium-Term Fiscal Strategy: Government Interim Progress[11]**

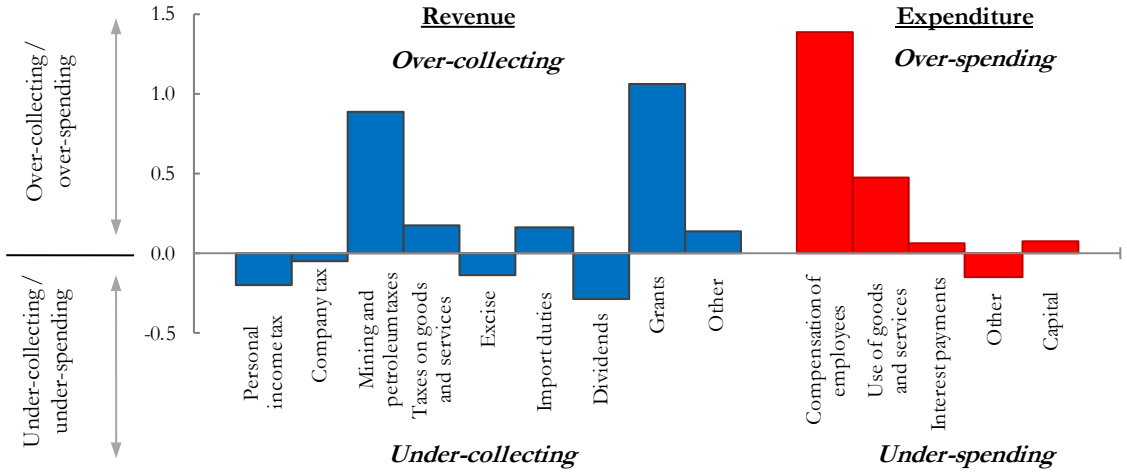
| | | 2016 | 2017 | 2018 | Progress |
|---|---|---|---|---|---|
| 1. | Achieve **revenue** (excluding grants) to GDP ratio of 14 percent by 2022 | 13.9 | 14.1 | 16.0 | Improvement* |
| 2. | Reduce government **expenditure** to 16 percent by 2022 | 20.9 | 18.7 | 21.0 | No progress |
| 3. | Reduce the government **debt to GDP** ratio to 30 percent by 2022 | 33.2 | 33.3 | 34.2 | Worsening |
| 4. | Maintain **non-resource primary balance** on a trajectory that will achieve a zero balance by 2022 | -4.5 | -1.6 | -2.7 | Some progress |
| 5. | Reduce **personnel emolument costs** from over 40 percent of total non-resource non-grant revenue in 2017 to less than 35 percent by 2022 | 51.5 | 46.5 | 48.0 | No progress |
| 6. | Raise the **public investment to GDP ratio** from less than 4 percent of GDP in 2017 to 5.5 percent in 2022 | 4.1 | 2.9 | 3.5 | Improvement** |

*Sources:* World Bank staff calculations based on the official FBO reporting.
*Note:* * The improvement in revenue is due to an increase in resource revenue. Ideally, resource revenue should be excluded from the ratio, to comply with the other MTFS target indicators.
** The improvement in the capital budget can be attributed to higher resource revenue. The capital budget includes items identified as 'out of scope for GFS coding purposes.'

9. **Higher-than-budgeted revenue from mining and petroleum taxes and development-partner grants supported strong revenue performance.** Mining and petroleum tax revenue exceeded its initial budget estimate by K 596 million (0.8 percent of GDP, Figure 7). This good resource-revenue performance can be attributed to higher oil and gas prices, which, in local currency (Kina) terms, rose by 34 percent year on year in 2018 (Figure 8). While data on tax payments are limited, Oil Search reported paying 48 percent more taxes in Kina terms in 2018, suggesting that overall tax receipts from the project rose in 2018. However, the critical question is whether these higher receipts can be sustained in future years or whether they are one-offs. Grants received from development partners were K 810 million (1 percent of GDP) higher than budgeted, reflecting both support given as a result of the earthquake, and a general tendency to under-budget this revenue item.[12] The largest underperforming item was dividends; originally budgeted at K 1,250 million, then increased to K 1,430 in the supplementary budget, actual receipts were K 1,033 million (still an increase on the K 842 million received in 2017). Revenues from PNG LNG remain small and are discussed in Box 3.

[10] PNG NSO 2019c.
[11] In November 2017, the Papua New Guinea's Treasury presented its Medium-Term Fiscal Strategy alongside the budget for 2018. At its heart are six quantitative targets to be achieved by end-2022, which together aim to ensure compliance with the Fiscal Responsibility Act, achieve macroeconomic stability, and help lay the foundations for higher investment and economic growth.
[12] In the original budget for 2018, development-partner grants to be received exceeded the amount of development-partner grants to be spent. As both items are executed by development partners off-budget, they should mirror each other.

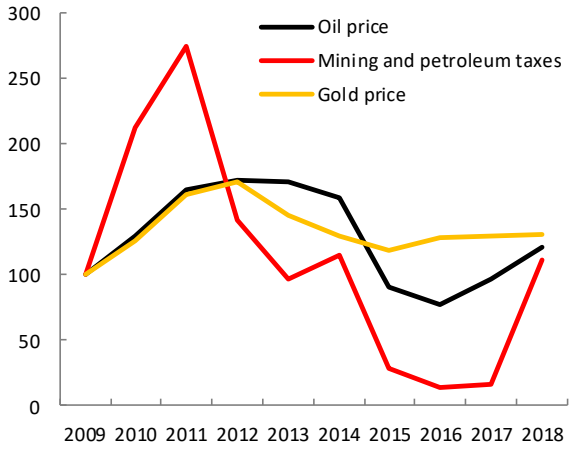
**Figure 7. Revenue and Expenditure Performance Against 2018 Budget**
(Percent of 2018 GDP)




*Sources:* PNG Treasury 2019; World Bank staff calculations.

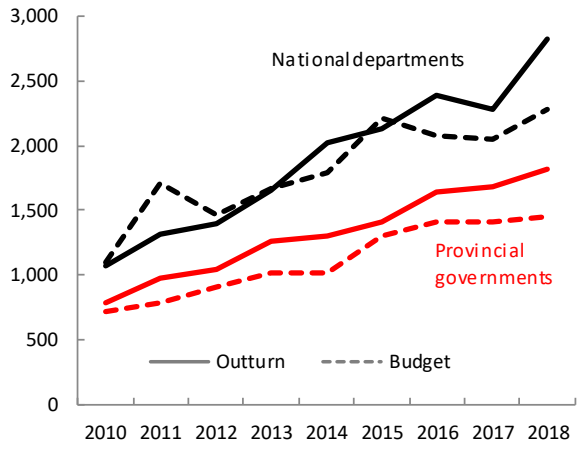
10. **On the expenditure side, the wage bill continues to prove difficult to control.** For 2018, spending on wages totaled K 5.2 billion (compared to the original budget of K 4.1 billion), an overspend of more than 25 percent (1.4 percent of GDP). Even by Papua New Guinean standards, this overspend is significant. The increase can be partly explained by unbudgeted annual 3 percent salary increases in 2017 and 2018, and the clearing of arrears and superannuation fund debts, but at a fundamental level the central government lacks sufficient control over recruitment and promotion. Overall public sector employment increased by 4.2 percent in 2018, with 1,680 teachers, 1,460 health workers, and 1,440 security personnel hired during the year, for which no appropriation had been made in the original approved budget. While Figure 9 shows that provincial governments have consistently exceeded their budgets for personnel emoluments since 2010, this has also been the case for national departments since 2016, with the size of the overspend averaging 0.5 percent of GDP between 2016 and 2018 (compared to 0.4 percent of GDP over the same period for provincial governments).

**Figure 8. Mining and Petroleum Receipts and Commodity Prices, 2009–18**
(Index, 2009=100)




*Sources:* PNG Treasury; BPNG.

**Figure 9. Original Budget and Outturn, Personnel Emoluments, 2010–18**
(Kina, millions)




*Source:* PNG Treasury.

11. **The government is fully aware of the challenges in containing personnel emoluments.** In 2016 the Organisational Staffing and Personnel Emolument Audit Committee (OSPEAC) was established—and more recently the Public Sector Organisational Reform Taskforce was formed—to oversee payroll audits and introduce improved system controls.[13] While establishing task forces and committees can be a part of successful reform, experience shows that this needs to be complemented by two things: (i) a declared high-level political commitment to reform; and (ii) political decision makers and their supporters experiencing direct benefits from its success. Without these direct benefits, reforms often fail.[14] This is particularly challenging when reforming public sector employment and remuneration, where rather than seeing direct benefits from reform, political leaders often must manage high levels of disgruntlement stemming from redundancies, pay restraint, and the elimination of ghost workers.

12. **The 2018 FBO notes that the government cleared K 295 million in non-payroll arrears in 2018.** However, the composition of the payments suggests that some arrears are still outstanding; while the Nambawan Super Limited (NSL) superannuation exit payment arrears appear to have been paid, arrears related to "Works, Medicine, Utilities, Rental and Other Arrears" detailed in the 2018 supplementary budget may still be outstanding in the sum of K 245 million (0.3 percent of GDP, Table 3).

**Table 3. Budgets and Payments to Clear Arrears, 2018**
(Kina, millions)

| Indicator | Supplementary budget, 2018 | Reported paid, 2018 | Difference | Difference, % of GDP |
|---|---|---|---|---|
| NSL superannuation exit payment arrears | 146.1 | 230.3 | +84.2 | +0.1 |
| Other arrears (Works, Medicine, Utilities, Rental and Other Arrears) | 310.0 | 64.8 | -245.2 | -0.3 |

*Sources:* PNG Treasury: 2018 Final Budget Outcome, 2019 Budget Volume 1.

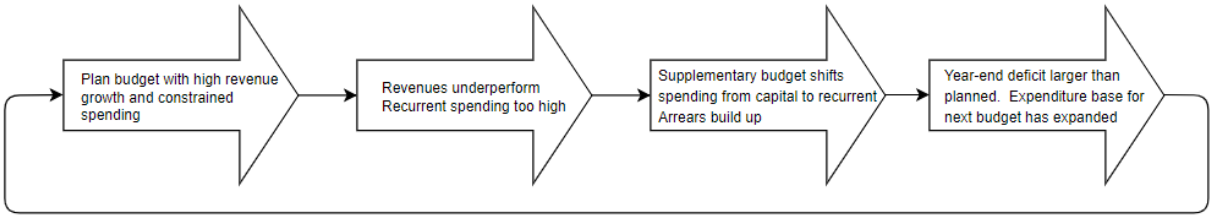
13. **Capital investment spending increased in 2018 from the historic lows of 2017.** The 2018 FBO indicates that capital spending totaled K 2 billion (2.7 percent of GDP) in 2018,[15] an increase from K 1.5 billion (2.1 percent of GDP) in 2017, but still low by historical standards. Major projects included the loan-financed upgrade of the Lae–Nadzab Road (at a total cost of K 800 million), the building of the landmark three-story Waigani court complex (K 384 million, including design and maintenance costs), spending on districts and rural hospital development, the West Pacific University (K 100-K 200 million) and improvements to the runway at Jackson's International Airport in the run-up to the APEC meetings (K 65 million).

**Box 2. Breaking the cycle of unrealistic budgeting**
***Understanding why budgets fail***

**Papua New Guinea is continuing to try to break the cycle of unrealistic budgeting.** The typical pattern, illustrated in Figure 10, is one of planning an annual budget that constrains expenditure, boosts revenue, and attempts to reduce the size of the overall and NRPB deficits. However, about six months into the financial year, it is usually clear that revenues are not performing as hoped, recurrent expenditure is getting out of hand, and the deficit will be much larger than budgeted, necessitating a cut in the capital budget and an increase in public debt. This pattern was broken somewhat in 2018 on account of higher-than-budgeted revenues, although expenditure still exceeded the budgeted limit, and the overall deficit was 0.2 percent of GDP higher than initially planned. However, the NRPB deficit widened substantially, to 2.7 percent of non-extractive GDP in the 2018 FBO (from 1 percent in the original budget), suggesting that non-resource revenues underperformed while public spending increased substantially.

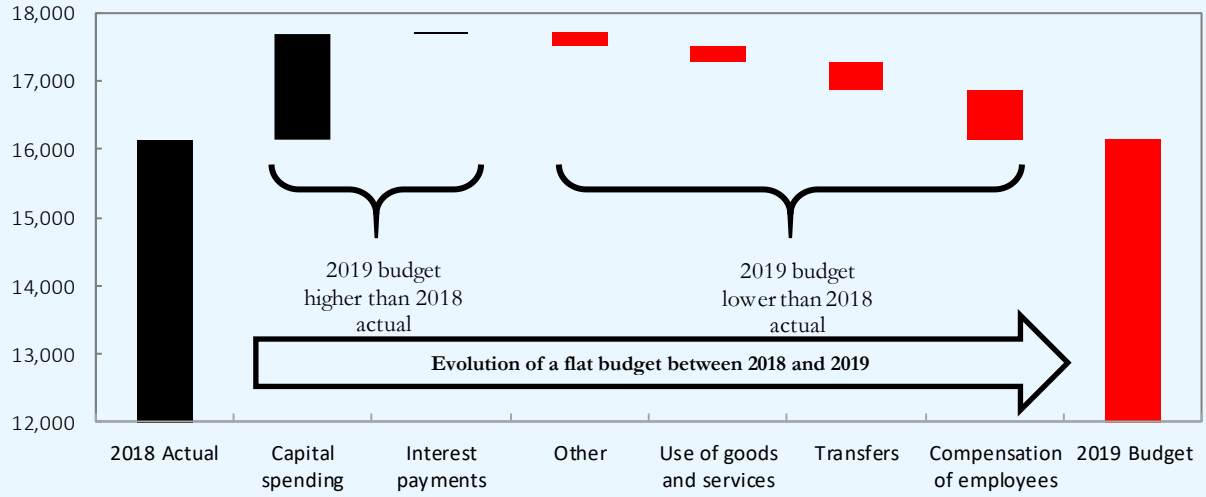
[13] PNG Treasury 2019.
[14] Turner and Kavanamur 2009.
[15] The total capital budget includes capital transfers provided by the central government to the sub-national level.

**Figure 10. Typical Papua New Guinea Budget Formulation and Execution Pattern**




**Given the final budget outcome for 2018, the 2019 budget looks unrealistic.** Perhaps most worryingly, the 2019 budget is based on a nominal *decline* in personnel emolument spending (by K 750 million; Figure 11), presumably underestimating the adjustments made in the 2018 supplementary budget. Every classification of spending other than capital expenditure and interest rates is also planned to decline, suggesting that the pattern illustrated in Figure 10 will be repeated. Our conservative budget estimates indicate that the overall fiscal deficit may exceed 3 percent of GDP and the NRPB deficit may rise to about 4 percent of non-extractive GDP in 2019.

**Figure 11. Variations in Expenditure, 2018 Outturn and 2019 Approved Budget**
(Kina, millions)



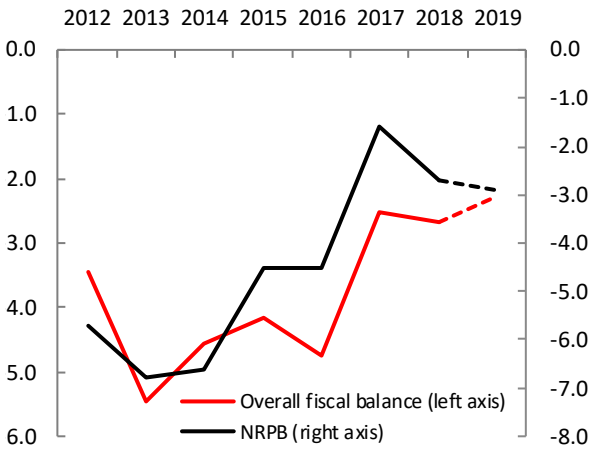

*Sources:* 2018 Final Budget Outcome and 2019 Approved Budget.

**Many countries fall into this cycle of unrealistic budgeting, which tends to result in an ever-higher public wage bill, rising public debt, low levels of public investment, and an overall decline in expenditure quality and service delivery.** If cash runs out mid-year, this cycle can even lead to macroeconomic imbalances as governments start requesting that central banks fill the financing gap by printing money. Breaking this cycle is not straightforward but is easiest to achieve when revenues are performing well, and determined efforts are made to restrict increases in recurrent expenditure. Papua New Guinea's decision to implement a fiscal rule, establish a sovereign wealth fund, and boost domestic revenues, can be part of the answer but this needs to be complemented with determined efforts to control the public wage bill. There is little to be gained in boosting tax compliance and closing loopholes if the additional revenues are immediately sucked up by a more rapidly growing wage bill.

14. **The widening of the NRPB deficit indicates a deviation from the fiscal-consolidation path.** Even though the narrative surrounding the government budget is one of spending restraint and domestic revenue mobilization, 2018 and 2019 were expansionary years, given the larger NRPB deficits, widening from

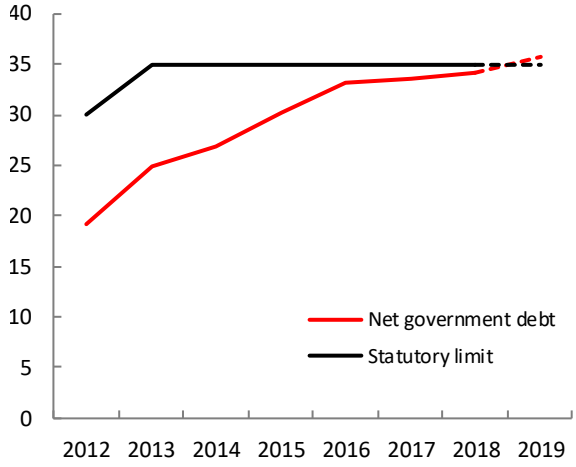
1.6 percent of non-extractive GDP in 2017 to 2.7 percent in 2018 and close to 3 percent in 2019 (Figure 12). However, fiscal policy is substantially tighter than in the previous years of 2015–16 when the NRPB deficit averaged 4.5 percent of non-extractive GDP. Moreover, the forward-looking budget plans announced by the government indicate a declining fiscal deficit to 2023.[16] Nevertheless, as discussed in Box 2, budget realism and credibility play an important role here, and favorable revenue performance and disciplined expenditure management will be required to keep to these plans.

**Figure 12. Overall and NRPB Deficits, 2012–19**
(Percent of GDP; percent of non-extractive GDP)




*Sources:* PNG Treasury; World Bank staff calculations.

**Figure 13. Net Government Debt, 2012–19**
(Percent of GDP)




*Sources:* PNG Treasury; World Bank staff calculations.

15. **Total public debt rose to 34.2 percent of GDP in 2018 and may surpass the legislated ceiling of 35 percent of GDP in 2019.** The 2018 deficit was financed with longer-maturity borrowing, which was in line with the Treasury's strategy of shifting away from short-term Treasury bills (T-bills) toward longer-term bonds and concessional loans. The stock of T-bills fell by K 517 million (0.7 percent of GDP), although this is only a small fraction of the remaining T-bill stock of K 8.7 billion. There was also a significant shift in 2018 toward external financing, principally from the US$500 million 10-year sovereign bond issued in the last quarter of the year (at an annual interest rate of 8.375 percent). Nigeria, with the same rating as Papua New Guinea of a 'B' sovereign risk rating (Standard & Poor's), achieved a lower yield (7.14 percent) on its recent U.S. dollar-denominated 10-year sovereign bond due to substantial external buffers (i.e. gross international reserves of over US$40 billion, an equivalent of 7 months of imports of goods and services).[17] Overall public debt of Papua New Guinea stands at 34.2 percent of GDP, up from 33.3 percent in 2017, and is estimated to exceed 35 percent in 2019 (Figure 13).[18]

16. **The sustainability of government debt has deteriorated and is far from assured.** Debt levels have almost doubled since 2012 with interest payments increasing by 2.5 times. The latest joint IMF-World Bank debt sustainability analysis (DSA) noted several vulnerabilities, including accelerated borrowing from non-Paris club creditors (principally China, with the share of Chinese debt in total external debt rising from 1.2 percent in 2010 to 23.5 percent in 2017) and high liquidity risks due to the still-high proportion of T-bills in the

[16] PNG Treasury 2018b.
[17] Economies with higher sovereign risk ratings achieved lower interest rates: Vietnam (BB, 5.5 percent), Uzbekistan (BB, 5.38 percent), and Indonesia (BBB, 4.75 percent), highlighting the difference a lower perceived sovereign risk can have on borrowing rates. Ukraine, with a lower sovereign rating, issued Eurobonds at a higher rate (B-, 9.75 percent).
[18] Statistics on public debt do not cover explicit state guarantees to state-owned enterprises which accounted for K 1.2258 billion or 1.6 percent of GDP at end-2018 (Basil 2019b). This amount is understated as it does not cover explicit debt obligations in the form of three loans serviced by NCDC.

overall debt mix. In 2018, the average blended interest rate on public debt also rose from 6.87 percent to 7.38 percent. The government has confirmed its commitment of pursuing a strategy of replacing expensive short-term domestic debt with concessional longer-term external debt while acknowledging an FX risk attached.[19] Table 4 summarizes the DSA conclusions since 2012.

**Table 4. IMF-WB Debt Sustainability Analysis Conclusions**

| Indicator | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|
| Risk of external debt distress | low | low | low | low | low | moderate | moderate |
| Overall public debt distress | | | increasing | heightened | heightened | heightened | moderate |

*Source:* IMF Article IV reports, various years.

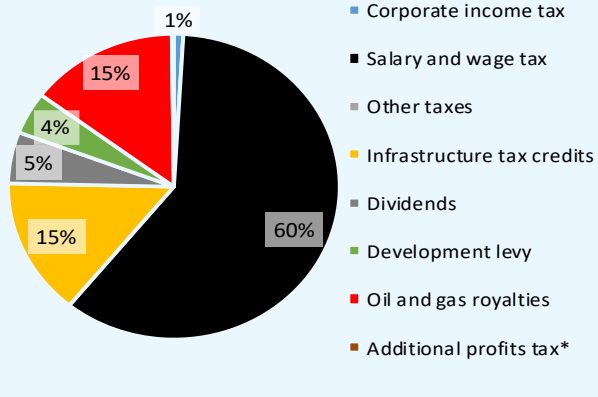
## Box 3. An update on gas revenues

***Transparency is improving, but questions remain***

**There has been a welcome improvement in the transparency of revenue flows from the PNG LNG project**. Papua New Guinea participates in the Extractive Industries Transparency Initiative (EITI) which produces detailed annual reports.[a] Also, Oil Search recently published its first Transparency Report,[b] providing information on its payments to the government concerning its 29 percent share in the PNG LNG operation. Together these reports give new insights into what revenue flows the government is receiving concerning PNG LNG. However, there are still significant information gaps.

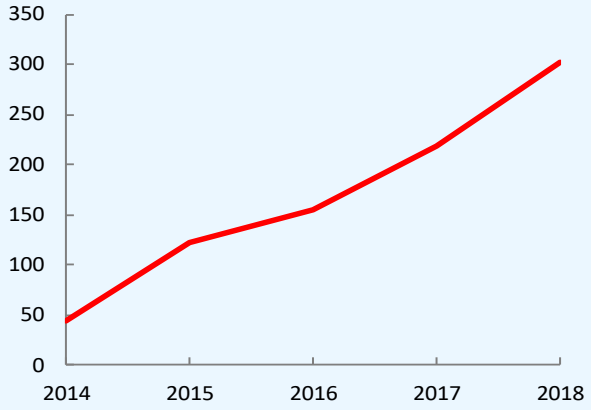
**The most striking conclusion from the 2017 EITI report is that the largest receipts are from salary and wage tax,** not royalties, development levies, dividends, or corporate tax (Figure 14). This finding is corroborated by Oil Search's own numbers, which show that salary and wage tax accounts for roughly 40 percent of its total payments to the government in 2016–18. As detailed in Box 7 of the December 2017 PNG EU, government receipts from PNG LNG have fallen well short of expectations, largely because (i) receipts are linked to profitability (more specifically the *netback value*) rather than sales or production, (ii) high declared costs (higher costs imply lower profits), and (iii) a complex web of exemptions and allowances that reduce declared profits to near zero. The 2017 EITI report details that around K 300 million (or just 4 percent of the K 8 billion of LNG export sales over the period) was received from the commercial operators with regard to PNG LNG, plus another K 50 million 'in-kind' by way of infrastructure spending (principally by ExxonMobil for maintaining the highlands highway).

**Figure 14. Source of PNG LNG Revenues from Commercial Partners, 2017**
(Percent of total K 350 million reported)




*Source:* Extractive Industries Transparency Initiative report, 2017.
*Note:* *Additional profit tax is too small (~0.2 percent of total) and hence is not visible on the chart.

**Figure 15. Stock of Oil Search Tax Losses and Credits, 2014–18**
(US$, millions)




*Source:* Oil Search annual reports, 2014–18.

[19] Basil 2019b.

**Oil Search's numbers show that over 2016–18 the effective royalty rate was 0.5 percent of sales.** Development levies are even lower, at 0.2 percent of sales. Royalties and development levies are calculated at 2 percent each (4 percent in total) of the netback value rather than on gross sales, and these numbers show what the difference between levying royalties on netback value rather than sales means in practice.

**Unless there is a sizeable increase in LNG prices there will be no noticeable increase in government revenues from PNG LNG until the initial loan financing is paid off in 2024.** This is because of the high costs involved in amortizing the initial capital investment, and hence declared profits are low. It is difficult to say what LNG price level would allow the royalties and development levies to significantly increase before 2024, but this is likely to be in the realm of US$10 per million metric British thermal unit (MMBtu), given average prices have been below this level since PNG LNG starting shipping.

**The accumulation of tax losses and tax credits by the commercial partners may mean that revenues to the government will not flow even after 2024.** Tax losses and tax credits comprise part of the 'deferred tax assets' on the operators' balance sheets and include such items as negative royalties and development levies, infrastructure tax credits, and losses carried over from previous years. The income statement and balance sheet for Oil Search in 2018 shows that while taxable profits of US$507 million are declared, and an income tax expense of US$166 million incurred, only US$85 million is actually paid as a cash expense to the government. Meanwhile, the stock of accumulated tax losses and tax credits *increases* by US$82 million to US$301 million (equivalent to 1.1 percent of GDP). As Figure 15 shows, the stock of Oil Search's tax losses and tax credits on its balance sheet have been steadily increasing. It is likely that the other PNG LNG partners are also accruing similar deferred tax assets, which will have a material impact on the country's fiscal revenues in the future.

**Finally, while transparency from the private sector partners in PNG LNG is improving, information on the revenues from the government's share remains opaque.** The government owns 16.57 percent of PNG LNG through Kumul Petroleum and has a 2.8 percent shareholding through the Mineral Resources Development Company (MRDC), held on behalf of landowners. According to the EITI report, these shareholdings entitle both Kumul Petroleum and MRDC to receive a share of sales, net of costs, which in 2017 was estimated at K 2.4 billion (US$750 million). These funds pass through 'GloCo' (PNG LNG Global Company LLC), operated on behalf of all co-venture partners by ExxonMobil PNG Ltd. However, neither GloCo nor Kumul Petroleum publish their annual reports or financial statements, and Kumul Petroleum did not submit a data return for the 2017 EITI exercise. According to the 2018 FBO, Kumul Petroleum paid dividends to the government, K 300 million (US$93 million) in 2017 and K 452 million (US$134 million) in 2018, however the absence of transparency in this area leads observers to wonder what happened to the remainder of the sales revenue received by Kumul Petroleum.[c]

a. EITI 2017.
b. Oil Search 2019c.
c. PNG Post-Courier 2019.

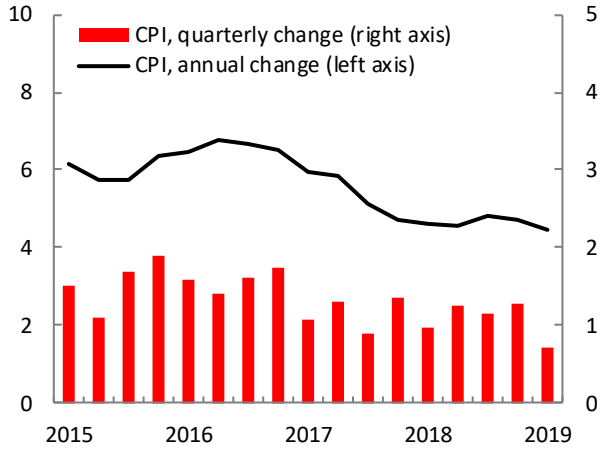
A moderate increase in food prices was the main contributor to lower inflation in 2018. Photo: Conor Ashleigh.

### *1.3. Monetary policy and price developments*

17. **Headline inflation continued to trend lower in 2018 and in early 2019.** Annual consumer price inflation averaged 4.5 percent in 2018 and in the first quarter of 2019 (Figure 16), its slowest pace in six years and below the rate anticipated in the January 2019 PNG EU (which assumed a stronger inflationary impact of currency depreciation). The key contributors to the increase in the consumer price index (CPI) during 2018 were housing (up 6.7 percent), transport (up 7.0 percent), and alcoholic beverages, tobacco and betel nut (up 4.1 percent). Prices of health-related goods and services rose markedly (up 14.0 percent) but contributed more modestly to the headline result owing to their relatively small share of household spending. The two most significant price subgroups—food and non-alcoholic beverages, and alcoholic beverages, tobacco and betel nut—together account for almost half the weight of the CPI.[20] Moderation of prices in these subgroups over the past two years, alongside slow economic growth, help explain the slowdown in headline inflation over the same period. Lower food and beverage price inflation may partly reflect developments in global markets, with food prices relatively flat and beverage prices sharply declining, in U.S. dollar terms, since 2015. Furthermore, growth in betel nut prices—an important source of inflationary pressures in recent years—has also moderated significantly.

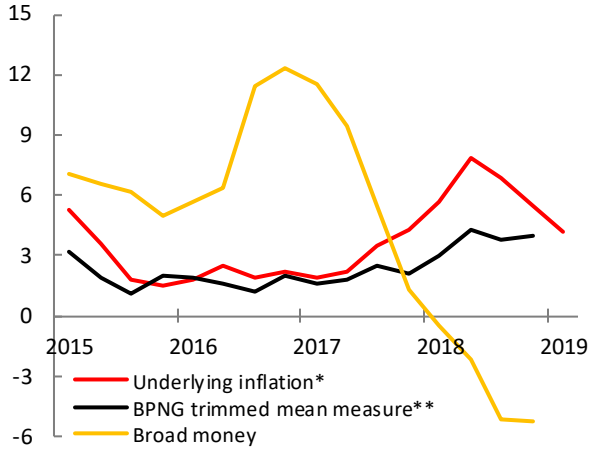
[20] On average in 2018 food and non-alcoholic beverages accounted for 30 percent of the CPI, while alcoholic beverages, tobacco and betel nut accounted for 16 percent.

**Figure 16. Inflation continued its downward march throughout 2018 and in early 2019**
(Percent change)




*Source:* National Statistical Office (NSO).

**Figure 17. Inflation remains relatively low despite a recent uptick in the annual rate**
(Percent change, year-on-year)




*Sources:* NSO; Bank of Papua New Guinea.
Note: * excludes seasonal items, excised goods, and regulated prices; ** excludes a fixed proportion of the highest and lowest price increases.

18. **However, underlying inflation rose significantly in 2018 in stark contrast to broader weaknesses in domestic economic activity.** Underlying inflation, which excludes price-controlled and seasonal goods (including food), gained momentum between mid-2017 and mid-2018 and has remained elevated since (Figure 17). In part, this reflects the inflationary impact of recent devaluations in the Kina (discussed later). It also likely reflects the lagged impact of an expansion in domestic liquidity that took place a year earlier and which was not commensurate with Papua New Guinea's stalling pace of economic growth.[21] There are mixed signals as to whether there has been a subsequent moderation in core price pressures. The upswing may have been held at bay by a recent combination of factors—a contracting economy, easing supply-side constraints (relating to improved foreign exchange availability), and a sharp decline in broad money—but it could prove short-lived. The impacts of the earthquake are now well in the past, while supply-side improvements should have just a transitory impact on price pressures, and the contracting money supply—most likely driven by recent policy developments—may soon have run its course.

19. **Following a strong surge between 2016 and 2017, growth in the money supply eased quickly before remaining in negative territory throughout 2018.** Broad money (M3) growth has fluctuated considerably in recent years (Figure 17). Growth in M3 accelerated rapidly in 2016 and 2017, coinciding with a sharp increase in the Bank of Papua New Guinea's (BPNG) net holdings of T-bills as the government monetized the fiscal deficit,[22] but growth in M3 subsequently eased and turned negative in 2018. This slowdown and contraction in M3 coincided with stabilization in net financial sector holdings of government debt and the elimination of BPNG's net T-bill holdings, potentially pointing to a more 'monetarily' responsible fiscal financing strategy by the government. The impacts of such changes on the money supply should be transitory, following a short period of adjustment. More recently, these effects are likely to have been compounded by other temporary factors such as the government's foreign exchange interventions (which are only partially sterilized, will tail off quickly as the backlog is cleared, and are discussed in detail below), and a one-off transfer of government bank accounts from commercial banks to the BPNG under the Public Money Management Regularisation (PMMR) Act.

[21] It can take over a year for monetary conditions to be fully transmitted to prices.
[22] Monetizing of the fiscal deficit is also known as 'printing money'. Growth in net claims on central government are found to be highly correlated with growth in M3 in recent years.

20. **Interest rates on domestic government debt are falling, but only because of the shift to external government borrowing.** The arrival of proceeds from the sovereign bond issuance and development partner concessional loans has seen yields on one-year T-bills begin to slide from a peak of 8.05 percent in November 2018—their highest level in 11 years—to 6.60 percent by March 2019. This decline in government borrowing costs is welcome but comes at the expense of the costs associated with higher exchange rate risks that will affect the repayment of Papua New Guinea's foreign borrowing, in particular the US$500 million 10-year bond issued in October 2018. It remains to be seen whether domestic borrowing rates will begin to creep up, or whether the new foreign borrowing will act to anchor domestic T-bill rates to external commercial rates after accounting for the expected exchange rate depreciation. Yields on 273-day and 182-day T-bills have not adjusted commensurately, declining by just 69 and 9 basis points, respectively, perhaps indicative of narrow auction participation and limited depth of the domestic market for government debt.

21. **The Kina Facility Rate (KFR), the BPNG's official policy rate, remains ineffective as a tool of monetary policy and has been unchanged for the past six years.** The KFR is BPNG's benchmark interest rate for the interbank money market but is entirely de-linked from movements in other market interest rates owing to a prevalence of excess liquidity in the financial sector and other weaknesses in the monetary policy regime. In practice, the KFR has been superseded by the exchange rate as the instrument of choice. As detailed in the January 2019 PNG EU, the BPNG has been responding to this situation with a spate of reforms. In its March 2019 Monetary Policy Statement, the BPNG drew attention once more to the importance of improving the monetary policy transmission mechanism, stating that better linkages between the policy rate and other market interest rates were necessary, and that recent liquidity absorptions such as via foreign exchange injections and the implementation of the PMMR legislation were insufficient to generate a level of scarcity that would trigger the use of the interbank money market.

22. **The authorities have significantly improved domestic access to foreign exchange, made possible through the government's US$750 million in foreign borrowing.** The slow adjustment of the government's crawling-peg exchange rate to falling global commodity prices at the end of the last commodity price cycle resulted in an overvalued exchange rate, a subsequent rundown in foreign exchange (FX) reserves, and the imposition of restrictions on access to foreign currency. Over the past year, the BPNG has been taking steps to improve the functioning of the inter-bank foreign exchange market and its oversight of foreign currency transactions and dealers.[23] Moreover, directives prioritizing FX access for strategic sectors have been withdrawn, and foreign exchange injections aimed at clearing the run-up of unmet FX orders have begun. FX interventions were scaled up from US$50 million a month in late-2018 to US$77 million (on average) during the first five months of 2019.[24] The remaining backlog of unmet FX orders, estimated at approximately US$360 million, is expected by authorities to be largely unwound during 2019, though up to another US$450 million may be required to fulfill overseas profit repatriation needs once the government finally rescinds a 2014-imposed ban on such flows. The waiting time for large FX orders (over K 3 million, roughly US$900,000) has eased from an average of six months in September 2018 to less than two months in June 2019, while smaller orders are being addressed immediately.

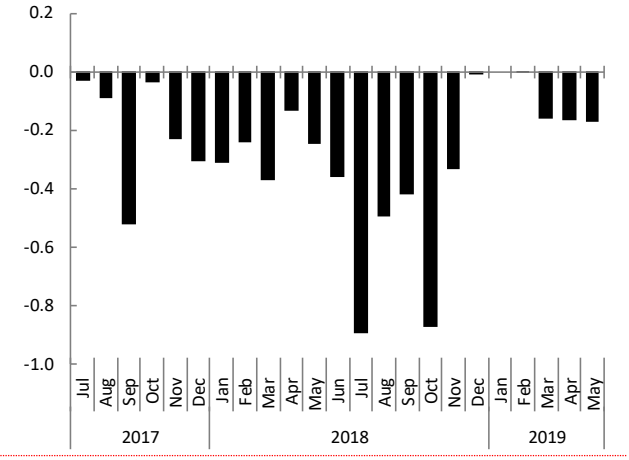
23. **As the economy rebounds and appetite for imports returns, the sustainability of this new status quo may come into question.** With the easing of foreign exchange restrictions, previously pent-up demand (not entirely captured by unmet orders) might be expected to manifest in accelerating demand for foreign currency. In addition to this, the government's continued deficit spending will also bring with it added imports impetus and corresponding FX needs. Reports[25] from early 2019 suggest that businesses continue to face delays

[23] A more extensive discussion of these and other related reforms can be found in the January 2019 edition of the Papua New Guinea Economic Update. Authorities' efforts in this area have been supported with technical assistance from development partners.
[24] The authorities claim to have disbursed US$385 million in the first five months of 2019.
[25] As discussed in BPNG's March 2019 Monetary Policy Statement.

and rationing when seeking FX, which could point to an underestimation of the scale of needs. While the proceeds of recent external financing arrangements currently place the government in a position to deliver FX relief to the economy (and recent inflows from resources and minerals taxes have also aided in this respect), the crucial question continues to be whether future FX inflows into the economy will be sufficient to meet these near-term needs before the US$750 million is exhausted. If not, and in the absence of increases in commodity prices, Papua New Guinea may find itself back in an all-too-familiar place, forced to decide between exchange rate stability, domestic restrictions on foreign exchange, and the consideration of another large external borrowing.

24. **The nominal effective exchange rate (NEER)[26] continued to depreciate in the first half of 2019, on track to record its seventh consecutive annual decline.** As the authorities have gradually allowed greater exchange rate flexibility, the value of the Kina has fallen to reflect weaker demand commensurate with the end of the commodity-price super-cycle. Depreciation against the U.S. dollar, in particular, picked up pace in mid-2017 and continued throughout most of 2018 (Figure 18), before moderating in December and the early months of 2019. At the same time, the Kina was not the only currency to depreciate against the U.S. dollar, given the strong U.S. economy and rising U.S. interest rates. A more holistic perspective on the Kina exchange rate is given by the NEER, which depreciated by about 3.2 percent in 2018–mainly on account of a stronger Japanese yen–and a further 0.3 percent in the first quarter of 2019.[27] Analysis by the IMF in 2018 estimated the Kina's overvaluation at about 10-11 percent.[28]

**Figure 18. The pace of depreciation has slowed**
(Percent change, average monthly US$/PGK exchange rate)




*Source:* Bank of Papua New Guinea.

[26] The nominal effective exchange rate is a measure of the value of a currency against a weighted average of several foreign currencies, often weighted by their share of that country's exports.
[27] Japan accounts for about 20 percent of PNG's exports, and thus its bilateral exchange rate has a material influence on the NEER. Other key trading partners are Australia and China, both of which saw their currencies appreciate only very slightly relative to the Kina.
[28] IMF 2018a.


**A decline in resource export volumes was more than offset by a favorable price effect in 2018. Photo: Conor Ashleigh.**

### *1.4. External sector*

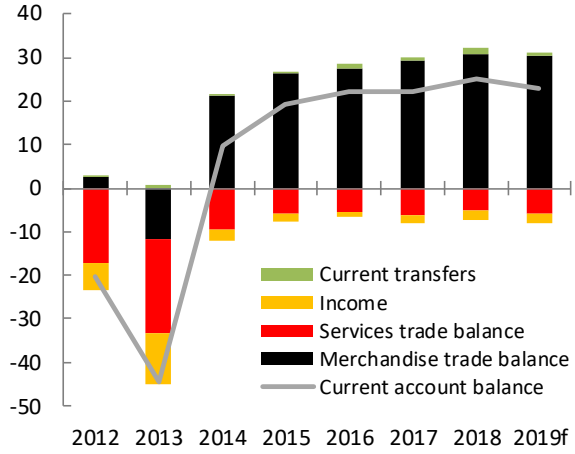
25. **Higher LNG prices and restrictions on imports helped achieve a record high current account surplus in 2018.** The average LNG price achieved by Oil Search in 2018 was US$9.86 per million British thermal units (MMBtu), 29 percent higher than in 2017. Meanwhile, import spending contracted by 14.8 percent in U.S. dollar terms. Taken together, this helped to achieve the highest current account surplus this century, reaching US$5.8 billion (25 percent of GDP). The severe earthquake of early 2018 was not enough to derail Papua New Guinea's external performance during the year. Although the merchandise trade balance drove most of the result, net services trade and net transfers also improved marginally, while net income flows edged lower (Figure 19). Current account surpluses provide a means for a country to build its wealth and pay down the debt and other obligations that it owes to the rest of the world. The current account has now been in surplus for every year since the commencement of production at PNG LNG in 2014, reflecting the immense value generated by the largest private sector investment in the country's history.

26. **The trade surplus widened in 2018 owing to an extractive-sector resurgence in the second half of the year.** Merchandise trade receipts rose by 0.6 percent, propelling the overall trade surplus to 25.8 percent of GDP, its highest level in over a decade. Buoyant global conditions for most of Papua New Guinea's key commodity exports shored up strength in prices, boosting the terms of trade by more than 10 percent and helping to offset the impacts of earthquake-induced production disruptions. Consequently, despite initial sluggishness, the value of merchandise exports rebounded strongly in the second half of 2018. A considerable

ramping-up of production in those sectors impacted by the earthquakes (LNG, condensate, and copper), also supported the late improvement. On the imports side, the value of merchandise imports declined by 16.7 percent in 2018, following a surprise jump in 2017.[29] Importantly, significant import compression has also played a role in supporting Papua New Guinea's trade surpluses. While the exact effects are difficult to quantify and are now likely to be receding after targeted policy action, restrictive access to foreign exchange has starved the non-resource economy of imports for a number of years.

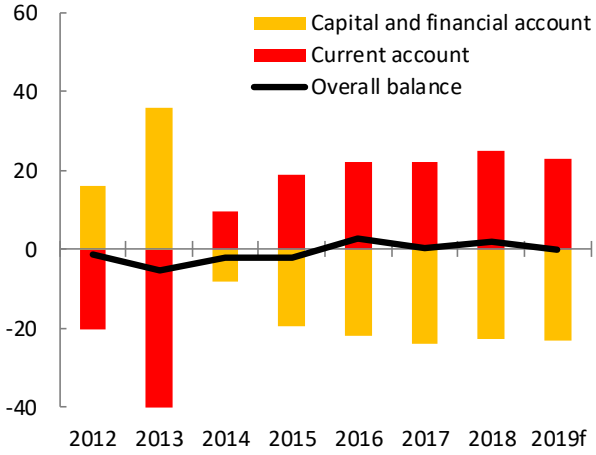
27. **Nevertheless, the record high current account surplus did not deliver significantly higher levels of international reserves or improved access to foreign exchange.** The revenues from higher LNG export sales were matched by higher outflows on the financial account to repay the US$19 billion cost of PNG LNG construction, most of which was borrowed externally (Figure 20). While total exports increased by 1.5 percent of GDP and imports fell by 4.2 percent of GDP in 2018, outflows on the financial account increased by 5 percent of GDP once inflows from the US$750 million in foreign borrowing are excluded.[30]

**Figure 19. Merchandise trade performance continued to be strong**
(Percent of GDP)




*Sources:* BPNG; World Bank staff estimates.

**Figure 20. The sizeable current account is being used to finance debt obligations**
(Percent of GDP)




*Sources:* BPNG; World Bank staff estimates.

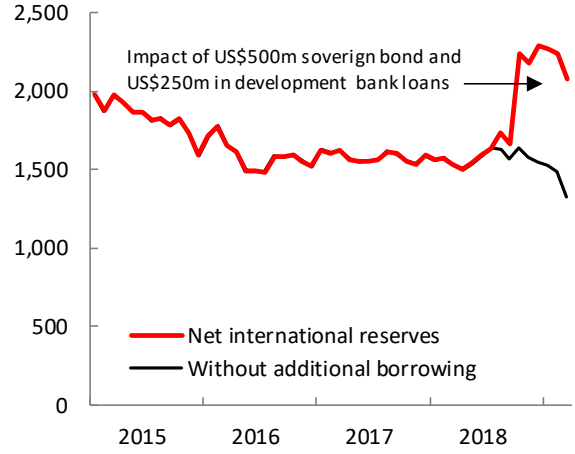
28. **Foreign currency inflows may have been stronger if not the for the slow pace of Kina depreciation.** The Kina depreciated against the U.S. dollar by 3.2 percent (on average) in 2018, and just by 0.2 percent in the first quarter of 2019, to reach K 3.37/US$ 1. The nominal effective exchange rate, which looks at the exchange rate between the Kina and the currencies of Papua New Guinea's major trading partners (namely Australia, China, and Japan) declined just 2 percent over the same period. This slow rate may not be enough to help Papua New Guinea's non-extractive exporting sectors. The real effective exchange rate (REER)—which accounts for movements in exchange rates in Papua New Guinea's major trading partners and adjusts for relative inflation—appreciated by 0.5 percent over this period.[31] Recent research suggests that the REER can have a significant impact on net foreign currency inflows into Papua New Guinea, with the effects through the imports channel being relatively larger than that from expanded exports.[32] Notably, the

[29] The jump in 2017 may have been due to APEC-related construction activity.
[30] In practice, most of the proceeds from LNG sales never come back 'on-shore' to Papua New Guinea, with both the sales transactions and the debt repayments taking place between off-shore bank accounts; hence, the balance of payments statistics are estimates of what would have happened had the LNG revenue come back to the country and then left again to service PNG LNG's debts.
[31] By comparison, recent modelling by Nakatani (2018) estimated that an additional US$330 million of inflows over 2015–17 would have accrued if the Kina's REER had been allowed to fall to a value that was 10 percent lower than that realized.
[32] Nakatani 2018; his simulations find that, in the event of a REER depreciation, import compression contributes more to net FX inflows than does a boost to exports.

recent REER appreciation may have contributed to foreign currency outflows by supporting higher levels of non-resource imports.

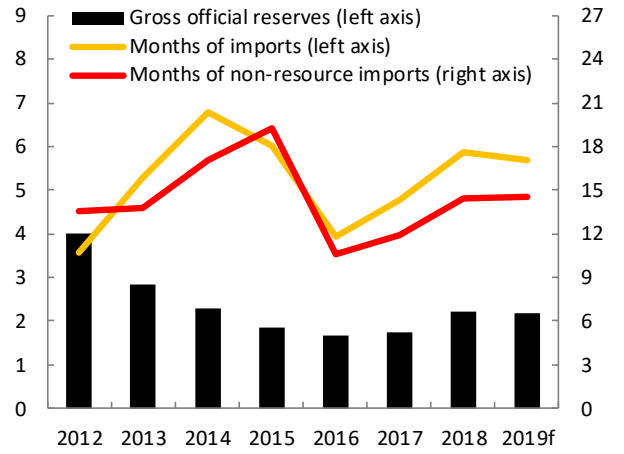
29. **Foreign exchange reserves have increased, but only due to foreign borrowing.** International reserves rose by 44 percent in 2018, reaching US$2.2 billion by the year's end, but had slightly moderated to less than US$2 billion by the end of March 2019. This increase has been due to the receipt of the proceeds from the US$500 million sovereign bond, as well as the US$250 million in Asian Development Bank and World Bank budget-support loans in the second half of 2018. Without these funds, reserves would have fallen by 3 percent in 2018, or 13 percent year on year to March 2019, to around US$1.3 billion (Figure 21). This decline is due to the relaxing of restrictions on foreign exchange and addressing the backlogs of foreign exchange orders, together with the increase in outflows on the financial account.

**Figure 21. Net international reserves improved due to sizable borrowing by the public sector**
(US$, millions)




*Source:* World Bank staff estimates.

**Figure 22. International reserves have not reached the pre-crisis levels**
(US$, billions; and months of import cover)




*Source:* World Bank staff estimates.

30. **The improved reserves position will give markets confidence in the authorities' ability to navigate challenges in external balances, including their continued support for the crawling-peg exchange rate regime.** Papua New Guinea's ratio of foreign exchange reserves to months of expected total imports was close to six months in 2019, up from 4.8 months in 2017 (Figure 22).[33] An alternative (and more conservative) measure of reserve adequacy, which may be more appropriate in the context of Papua New Guinea[34] is the ratio of reserves to expected months of non-resource sector imports. Non-resource imports cover rose to 14.5 months in 2018, up from 11.9 months in 2017.

[33] Months of import cover is calculated by dividing current international reserves by projected average monthly imports for the following year. It indicates how long a country might expect to be able to continue paying for its imports if faced with a sudden stop in access to foreign exchange.

[34] Given that resource companies keep the proceeds of their exports outside the country, and thus would not be expected to rely on central bank support to cover their import bill in the event of a shock to PNG's external accounts, the ratio of reserves to non-resource sector imports may be a more accurate representation of the size of the buffer available to authorities in the event of balance of payments distress.

Papua New Guinea's growth outlook remains positive but volatile, subject to extractive sector performance. Photo: Alana Holmberg.

## 2. Outlook and risks

### *2.1. Global outlook and risks*

31. **Global growth is expected to slow in 2019–21 from its recent highs in 2017–18.**[35] The global economic growth rate is projected to slow from 3 percent in 2018 to 2.6 percent in 2019, reflecting a broad-based weakness in advanced economies and major emerging market and developing economies (EMDEs) at the start of the year. As recent softness abates, global growth is projected to gradually accelerate to 2.8 percent on average in 2020–21. Growth in advanced economies is projected to moderate from 2.1 percent in 2018 to 1.6 percent on average in 2019–21, toward its potential rate, as capacity constraints become more apparent and labor markets tighten. Growth in EMDEs is projected to slow from 4.3 percent in 2018 to 4 percent in 2019, before recovering to an average of 4.6 percent in 2020–21. This forecast assumes a waning impact of the financial pressures currently weighing on economic activity in some large EMDEs (such as Argentina and Turkey, for example).

32. **Global economic conditions are expected to remain challenging over the forecast period**. The increase in tariffs by China and the United States announced in May 2019 are likely to have a more significant impact on the global economy than the tariff hikes of 2018. Beyond economic losses for the affected exporters, the re-escalation of trade tensions is contributing to heightened policy uncertainty, which is expected to dent confidence and investment. Barring a renewed escalation of trade tensions, global trade growth is projected to weaken from 4.1 percent in 2018 to 2.6 percent in 2019, and then stabilize at an average of 3.2 percent in 2020–

[35] World Bank 2019f.

21 (Figure 23). This forecast assumes the implementation of new stimulus measures in China—and, to a lesser degree, the euro area—and a firming of domestic demand in some EMDEs. This modest rebound notwithstanding, global trade is expected to be weaker than previously envisaged over the forecast horizon reflecting a softer outlook for global investment and evidence of a lower income elasticity of trade.

33. **Global financing conditions are expected to remain volatile, even if generally more supportive.** This reflects a more accommodative monetary policy stance adopted by the major central banks in the near term due to the deteriorating global growth prospects. Despite the recent recovery of EMDE markets from the 2018 correction episode, there is still a considerable risk of "monetary shocks" associated with global policy uncertainty. Financial market volatility will continue to have the strongest impact on economies with high vulnerabilities, weak growth prospects, and elevated policy uncertainty. The eventual rise of advanced-economy yields would have a negative effect on capital flows to EMDEs. Policy uncertainty, geopolitical risks, and security concerns could also continue to adversely impact EMDE capital inflows. Oil prices are forecast to average US$66 per barrel in 2019 and US$65 per barrel in 2020, with high uncertainty surrounding the outlook.[36] Overall, metal prices are expected to decline slightly in 2019 and 2020, reflecting a weaker outlook for global metal demand. Agricultural prices are expected to decline in 2019 before stabilizing in 2020 (Figure 24).

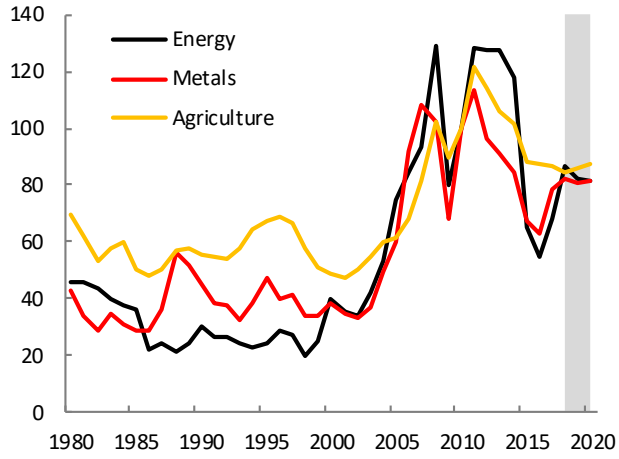
**Figure 23. Global GDP and trade volume growth will moderate further**

(Percent)


*Source:* World Bank 2019f.

**Figure 24. World commodity prices are expected to decline slightly**

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




*Source:* World Bank 2019c.

34. **Risks are on the downside.** Considerable uncertainty surrounds the outlook for the global economy. The balance of risks remains firmly on the downside and has recently intensified, reflecting the re-escalation of trade tensions amid heightened global uncertainty. Although unlikely in the near term, simultaneous, sharper-than-expected slowdowns in China, the euro area, and the United States could trigger a significant downturn in global economic activity. The further escalation of trade tensions could be highly disruptive to global activity amid the presence of complex value chains. The risk of severe and broad-based financial stress adversely affecting the outlook for EMDEs remains high amid elevated debt levels in many economies. Policy uncertainty and geopolitical risks remain elevated and could negatively impact confidence and investment both in affected economies and globally. Policy uncertainty is particularly elevated in some European economies, including in the United Kingdom as it transitions out of the European Union.

[36] World Bank 2019c.

## 2.2. Papua New Guinea's economic outlook

35. **The medium-term economic outlook remains positive, supported by the extractive sector.** Economic growth is forecast to recover in 2019–21, after bottoming out in 2018 when output in the extractive sector was affected by the earthquake in the highlands area. Real GDP growth is projected to jump to about 5.6 percent in 2019 and then hover between 3.1-3.5 percent in 2020–21 (Figure 25). This baseline scenario assumes a resumption of strong output from the construction sector in 2020–21, following agreements signed for the Wafi-Golpu project (a gold and copper mine in Morobe province) in December 2018 and the new Papua LNG project (the Elk-Antelope gas field in Gulf province) in April 2019. Consequently, the contribution from the construction sector to GDP growth is expected to rise from 2020 onward. There are also other resource and energy projects in the pipeline, including the Frieda River project (a copper and gold mine) and the PNG LNG expansion (the P'nyang gas field), but their construction phases fall beyond our current forecast period (Table 5). Moreover, no definite dates are available for the construction and production phases for most of these new projects. The rest of the non-extractive economy is expected to show stable average annual growth rates over 2019–21, with agriculture, forestry, and fishery growing by 3 percent per year, manufacturing by 3.5 percent, and the services sector by 3 percent.

**Table 5. Proposed and On-going Commercial Investments in Papua New Guinea**

| Project name | Initial investment | | Additional output per annum | | Tentative timing | |
|---|---|---|---|---|---|---|
| | US$, billions | % of GDP | Volume | % increase on existing output | Construction | Production |
| Papua LNG | 13 | 55.8 | 5.4 million tons | 62 | 2021–24 | 2024 |
| P'nyang LNG | 3 | 12.9 | 2.7 million tons | 31 | 2024–28 | 2028 |
| Wafi-Golpu | 2.8 | 12.0 | 7.5 tons gold; 180,000 tons copper | 12; 180 | 2020–24 | 2024 |
| Frieda River | 6.0 | 25.8 | 5.5 tons gold; 175,000 tons copper | 8.9; 175 | 2022–26 | 2026 |
| Ramu NiCo expansion | 1.5 | 6.4 | 34,000 tons nickel; 3,300 tons cobalt | 100; 100 | 2021–24 | 2024 |
| Pasca A | 0.6 | 2.1 | 0.2 million tons LPG | No existing production | 2021–22 | 2022 |
| Woodlark Island Gold | 0.2 | 0.6 | 2.4 tons gold | 4 | 2021–24 | 2025 |
| Port Moresby Power Station | 0.1 | 0.4 | 58 megawatts | 10 | 2017–19 | 2019 |

*Sources:* Media reports, company websites, World Bank staff estimates.

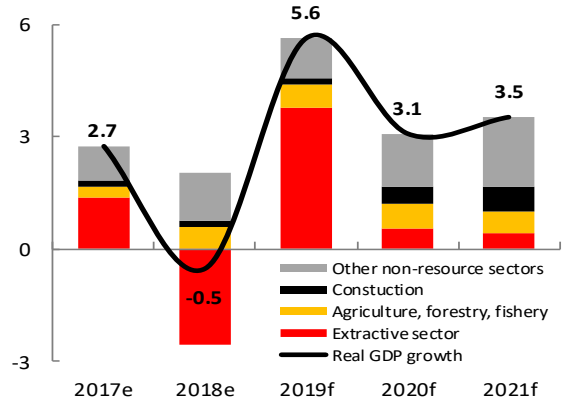
36. **The medium-term fiscal consolidation should lead to better fiscal and debt sustainability.** As the government improves its budgeting realism and enhances the counter-cyclical fiscal policy framework, the overall and the NRPB deficit should begin to narrow from 2020. This would require instituting proper budget controls over the wage bill and better efficiency in capital transfers to the sub-national level. A renewed focus on the MTRS implementation should spur reforms aimed at revenue mobilization.[37] However, actual results from the MTRS implementation will be seen much later, as these policy reforms usually take time. Consequently, the debt-to-GDP ratio is estimated to remain at elevated levels and might start decreasing over the medium term, from a peak of over 36 percent of GDP in 2019 to below 35 percent by 2021 (Figure 26).

37. **The construction boom is expected to benefit Papua New Guinea's external accounts over the medium term.** While revenue from merchandise exports is anticipated to stabilize, import spending on goods and services will rise gradually, reflecting the construction phase in the resource sector and, more generally, the economic recovery. As a result, the current account balance will narrow and be financed by additional inflows of foreign direct investment and external borrowing for the implementation of the new resource projects. As

[37] Basil 2019.

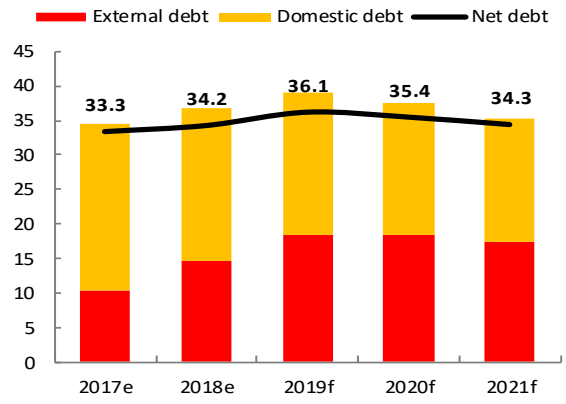
observed during the previous LNG-led construction boom, the current pressure on the exchange rate may reverse and lead to an accumulation of international reserves at the BPNG. A discussion of the risks and challenges—both foreign and domestic—to our forecasts is found in the following sub-section.

**Figure 25. GDP growth will be subject to extractive sector performance**
(Percentage point contribution to growth)




*Source:* World Bank staff estimates.

**Figure 26. Government debt is expected to stabilize in the baseline scenario**
(Percent of GDP)




*Source:* World Bank staff estimates.

## 2.3. Risks and challenges

38. **Papua New Guinea's medium-term macroeconomic outcomes remain subject to downside risks.** Although domestic GDP growth will resume, the growth rate may be volatile owing to external and domestic factors. This growth volatility is subject to the challenging external environment and an uncertain performance of the major (existing and new) resource projects in the country. Commodity-price and natural-disaster shocks may continue to impact extractive sector performance, with negative implications for the rest of the economy. Potential delays in the implementation of new resource projects may also impact macroeconomic outcomes, affecting the current underlying assumptions of the baseline scenario. The medium-term fiscal and debt sustainability agenda may be undermined by a challenging implementation of the fiscal consolidation strategy. Inability to reinstitute fiscal discipline and bring fiscal consolidation back on track may lead to higher debt-to-GDP ratios (above the legislated threshold of 35 percent of GDP) than assumed in the baseline scenario. Externally, if economic growth in Australia, China, and Japan—Papua New Guinea's main trading partners—slows more dramatically than anticipated, demand for Papua New Guinea's key commodity items may be affected, placing downward pressure on the Kina and eroding external buffers.

39. **To mitigate downside risks and strengthen economic resilience for absorbing shocks, the government should focus on its diversification agenda.** The recently-adopted Medium-Term Development Plan for 2018–22 (MTDP III) sets the stage for more inclusive and sustainable national development.[38] The MTDP III focuses on the development of physical and human capital and the strengthening of governance and institutions as the most critical cross-cutting areas for development. It also targets sector-specific issues and identifies a set of implementation actions for each priority sector. Agriculture is a priority sector owing to its large share of the economy (18 percent of GDP) and the significant share of the population living in rural areas and involved in subsistence and cash income agriculture (roughly 87 percent). The authorities should consider a set of policy options and responses that can secure sustainable rural livelihoods in food and agriculture, as discussed in detail in Part B below.

[38] PNG DNPM 2018.

Part B

# Special focus

## Securing Sustainable Rural Livelihoods in Food and Agriculture


The best prospects for securing sustainable rural livelihoods will come from support to subsistence and cash income agriculture. Photo: Mirzohaydar Isoev.

## 1. Agriculture is the mainstay of sustainable rural livelihoods

40. **Millions of Papua New Guineans depend on diverse agriculture activities for their livelihoods.** An estimated 87 percent of Papua New Guineans live in rural villages,[39] around 75 percent of these are engaged in a diversity of subsistence and cash income agriculture activities, and many are poor (Box 4). Subsistence activities are dominated by traditional staple products, while a variety of primary (fresh foods, fresh fish, and livestock) and export (coffee, cocoa, palm oil, copra, and copra oil) products are the main sources of cash income. Value-added products, such as virgin coconut oil and spices, are also beginning to emerge and provide additional streams of income (Box 5). Most rural villagers combine traditional staple and cash income activities, and a small yet increasing number are also engaged in value-added activities. Capturing the diversity in agriculture activities is important in as far as it serves to illuminate issues around constraints and opportunities in the sector and provides a pathway to actions that can be taken to strike a balance between subsistence and cash income activities to secure sustainable rural livelihoods. These issues and the implications for rural villagers in Papua New Guinea are discussed in the following sections.

[39] PNG NSO 2011.

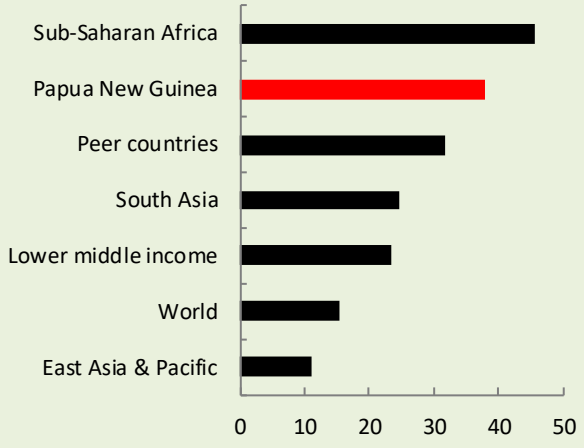
## Box 4. Poverty in Papua New Guinea
*An overwhelmingly rural phenomenon*

**From a global as well as a regional perspective, the prevalence of extreme poverty in Papua New Guinea is relatively high.** In 2010, about 38 percent of the population lived below the internationally-recognized extreme poverty line of US$1.90 per day based on purchasing power parity (PPP) in constant 2011 prices. This incidence of poverty significantly exceeds the poverty rate in South Asia (24 percent), is only slightly below that in Sub-Saharan Africa (46 percent), and is one of the highest rates in East Asia and the Pacific (Figure 27). It is also higher than in many of Papua New Guinea's lower-income, resource-rich peers.

**Poverty is an overwhelmingly rural phenomenon in Papua New Guinea.** Almost 90 percent of the poor reside in rural areas, and those engaged in agricultural activities are much more likely to be poor than others. People living in households headed by those working in agriculture, whether self-employed or a wage earner, are also more likely to be poor. More than half the poor (55 percent) live in households where the head is self-employed in agriculture, indicating that poverty is intimately tied with low agricultural productivity in a semi-subsistence setting. Households where the household head is engaged in agriculture are, on average, no better off than households headed by the economically inactive.

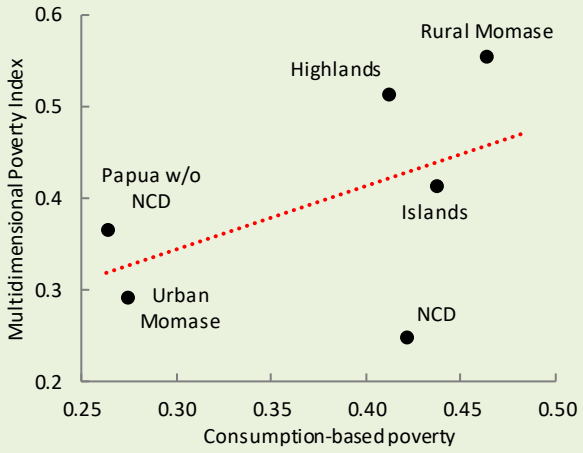
**The two regions with the highest poverty rates in Papua New Guinea are both rural and have a high proportion of inhabitants that rely on agriculture for their livelihoods.** Using the consumption-based poverty measure, 46 percent of people in rural Momase and 41 percent of people in the Highlands are poor (Figure 28). Combined, they account for about two-thirds of the country's poor, with the Highlands region contributing the largest share. In comparison, the multidimensional poverty index in rural Momase and the Highlands is 55 percent and 51 percent, respectively; together, these regions account for just over half of Papua New Guinea's multidimensional poverty.

**Figure 27. Extreme poverty in Papua New Guinea is relatively high compared to most other economies**
Share of population living below US$1.90/day PPP 2011 (%)




*Source:* World Bank 2018c.

**Figure 28. Two of Papua New Guinea's rural regions have the highest levels of poverty**




*Source:* World Bank 2018c.
*Note:* Multi-dimensional poverty index and percent of population living on less than US$1.90/day PPP 2011.

41. **Rural villagers typically engage in a variety of subsistence and cash income agriculture activities.** The main subsistence agriculture produced by rural villagers in Papua New Guinea are staple foods, including root crops (sweet potato, cassava, yam, taro), sago, and banana. Sweet potato accounts for about 67 percent of total food production, the other staples about 22 percent, and the remaining crops such as garden foods[40] account for the balance. Sweet potato production is the most common, with roughly 80 percent of the rural population engaged in this activity. The main cash income agriculture produced by rural villagers are

[40] These include leafy green vegetables such as pumpkin tips, cabbage, fern fronds, Chinese cabbage, and taro leaves.

coffee, fresh foods, betel nut, and cocoa. Coffee and cocoa, along with palm oil, copra and copra oil, are the main export commodities and, except for oil palm, are grown mostly by rural villagers. Around 41 percent[41] of oil palm is grown by rural villagers, while the balance is grown on plantations—a considerable contrast to the roughly 88 percent of coffee, 98 percent of cocoa, and almost 100 percent of coconut (copra and copra oil) that is grown by smallholders. Coffee accounts for about 33 percent of rural villagers' annual cash income, while 22 percent comes from fresh foods,[42] 10 percent each comes from betel nut and copra, and less than 3 percent each comes from oil palm, firewood, fresh fish and shellfish, potato, tobacco, and livestock. Fresh food production is by far the most common, with more than 90 percent of the rural population engaged in earning cash income from this activity. There is growing demand for fresh food from the major markets of Lae and Port Moresby. It is estimated, for example, that around 900 tons of sweet potatoes are shipped each month to Port Moresby from the Highlands Region.[43] In addition, rural villagers are beginning to produce value-added products. High-value coconut products, such as virgin coconut oil and other by-products, are gaining popularity (Box 5).

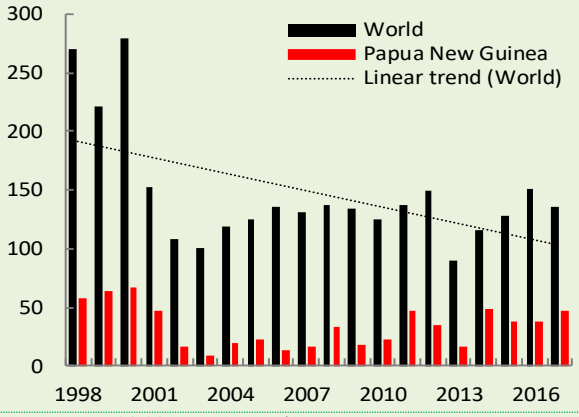
## Box 5. The fall and rise of coconut

***Boosting rural villagers' production of high value coconut products***

**Reflecting global trends, copra exports—one of the main commercial crops—are falling.** World exports of copra have been in a long-term downward trend for decades (Figure 29). During the 1990s world exports fluctuated between 200,000 and 300,000 tons. Since 2000, world exports have mostly been between 100,000 and 150,000 tons. The decline reflects the increasing dominance of palm oil in world trade in edible oils. Papua New Guinea's copra exports have fluctuated in recent decades, hovering around 60,000 tons in the 1990s before falling to an average of 29,000 tons since 2000. There was a sharp increase in exports in 2013–14, followed by a period of decline and stagnation, and a moderate increase again in 2016–17, albeit well below export levels of the late 1990s and early 2000s.

**Figure 29. Copra exports have risen in recent years**

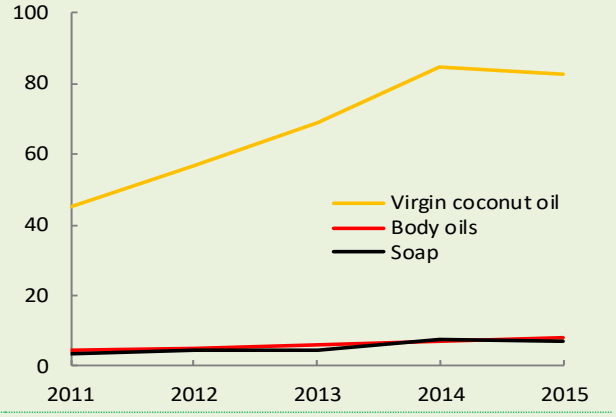
(Tons, thousands)




*Sources:* FAOSTAT (www.fao.org/faostat); KIK.

**Figure 30. Exports of virgin coconut oil, body oils, an soaps have risen significantly**

(Tons)




*Source:* KIK.

**High-value coconut products, especially virgin coconut oil but also body oils and soaps, are beginning to emerge alongside traditional coconut and other commodities.** In contrast to traditional coconut products, the production of high-value coconut products in Papua New Guinea has risen and is emerging as a viable alternative to the production of copra. Virgin coconut oil production more than doubled between 2011 to 2015 (from 56 to 113 tons); the output of body oils and soaps also increased over the same period. It is estimated that there is a current capacity to increase production by between seven and 20-fold (PHAMA 2017). Exports of virgin coconut oil and soap are also increasing (Figure 30). Export of all products more or less doubled in 2011–15. While export volumes of these

[41] Palm Oil Industry Statistics, 2014 Q3.
[42] "Fresh food" refers to introduced temperate climate vegetables such as broccoli, carrot, tomato, and capsicum, including Irish potato.
[43] Kanua and Bourke 2014.

products are considerably lower than that of copra, they are nonetheless forecast to rise as small enterprises mature in the domestic market and move into the export market.

**Kokonas Indastri Koporesen (KIK), the commodity board responsible for the coconut industry, is playing a crucial support role.** In 2002, the coconut industry was deregulated, the Copra Marketing Board was replaced by KIK, and more than 50 years of state-controlled copra marketing ceased. The KIK Act 2002 defines the roles and responsibilities of KIK and although it does not include high-value coconut products it does specify that products other than coconut products may be authorized by the Minister of Agriculture and Livestock. To date, KIK has engaged with 14 producers including six of which have received financial support (totaling K 1.4 million) for the construction and upgrading of facilities, the purchase of processing machinery, and upgrading to meet Hazard Analysis and Critical Control Points (HACCP) accreditation standards (KIK 2017). KIK has also initiated coconut replanting and new planting schemes in two provinces and established eight coconut nurseries in strategic locations. KIK's continued support will be crucial, particularly for the fledging high-value coconut production sector. There are many more producers of high-value coconut products than are currently being supported, who would benefit from financial and technical support, so as to gain greater access to domestic markets. For those ready to access export markets, of which there are potentially a handful already, the Pacific Horticulture and Market Access (PHAMA) initiative will also be an important partner. In cooperation with KIK, PHAMA has already been assisting potential exporters with HACCP accreditation and their role will be crucial in the future as more producers graduate into the export market.

42. **Subsistence agriculture provides the primary source of food energy and protein for rural villagers.** Staple foods, in particular, are the main source of food energy (68 percent) and food protein (42 percent) for rural villagers with significantly lesser amounts from a variety of other products. The heavy reliance on staple foods (especially sweet potato), which are low in vegetable and animal protein, is one of the main factors contributing to the high levels of stunting among children. After staple foods, garden foods are the next main source of food energy (8 percent) and food protein (15 percent), followed by meat which provides 5 percent of food energy and 13 percent of food protein, and fish (1 percent of food energy and 12 percent of food protein). Pigs, chickens, cattle, fish, and shellfish are the most important animal foods consumed. Driven by a resurgent commercial poultry sector, the availability of chicken, in particular, has increased over the past decade.[44] Food energy and protein come mostly from locally-produced foods; however, small amounts also come from imported foods (mainly rice and wheat). Imported rice and wheat each provide less than 10 percent of both food energy and food protein. Over the decade to 2013, the volume of rice imports decreased significantly while the volume of wheat imports remained steady.[45]

43. **Subsistence agriculture also provides food security for rural villagers when cash income-earning activities are limited.** Subsistence agriculture provides food security when rural villagers are not willing or able to engage in cash income-earning activities. Factors that determine rural villagers' engagement in income earning opportunities are several. One relates to income-earning possibilities, or returns to labor, of different cash income products. For crops such as Irish potato, oil palm, coffee, cocoa, and most fresh foods—where returns to labor are relatively high—rural villagers are less likely to revert to growing staples. However, in the case of copra and rubber production—where returns to labor are comparatively low—rural villagers are more likely to revert to subsistence activities.[46] As a general rule, when the returns to labor are below the average daily wage rate, rural villagers will be more likely to stop producing and vice versa when the returns to labor are above the average daily wage rate. In cocoa, for example, there is a clear correlation between prices and production—when prices increase, there is a corresponding increase in production and vice versa.[47] Other

[44] Draaijer 2019.
[45] FAOSTAT.
[46] Bourke and Harwood 2009.
[47] Aipi and others 2012.

factors also determine rural villagers' engagement in income-earning opportunities such as, for example, changes in weather patterns due to El Niño that delay the fruit-bearing of coffee and cocoa trees.[48] Also, the occurrence of pests and diseases such as coffee berry borer (CBB) that result in crop losses may cause rural villagers to revert to growing staples, or poor road conditions may prevent the delivery of bags of cocoa beans to pick-up points. Furthermore, an inability to find buyers in the case of the new value-added products—such as, for example, virgin coconut oil—can also determine whether rural villagers remain engaged in income-earning activities. Sub-section 2 explores these and other constraints in more detail.

44. **Agriculture is also a significant contributor to Papua New Guinea's export earnings.** Agriculture (17 percent) followed by fisheries (4 percent) and forestry (2 percent) is the second largest contributor to export earnings after minerals (77 percent). Palm oil (51 percent) is the largest contributor followed by coffee (27 percent), cocoa (15 percent), and copra and copra oil (7 percent).[49] Except for palm oil and copra, there has been a steady overall decline in agriculture export volumes over the last decade. Over the period 2009–18, exports of coffee and cocoa fell by 6 percent per annum on average while copra oil exports declined by around 20 percent over the same period. While exports of copra oil have continued an upward trend, rising by 8.2 percent between 2017 and 2018, exports of palm oil decreased by 3.3 percent over the same period. Predictions are for an upswing in prices for coffee and cocoa and a fall in palm oil prices through 2019 and 2020.[50]

45. **Several core agencies provide government support to the agriculture sector.** The main agriculture agencies are the Department of Agriculture and Livestock (DAL) and the commodity boards. Among other things, DAL is responsible for policy and its implementation in the agriculture sector, including support to provincial governments with the provision of extension services. The key commodity boards are those associated with the main export products and include the Oil Palm Industry Corporation (OPIC), the Cocoa Board (CB), the Coffee Industry Corporation (CIC), and the KIK; fresh foods fall under the Fresh Produce Development Agency (FPDA). A considerable variation exists in terms of their financial appropriations for the provision of services (including extension services). In 2010, of the estimated K 105 million that was appropriated for extension services, around 10 percent was provided through DAL and the National Agricultural Research Institute (NARI), around 15 percent through a combination of OPIC, FPDA, CIC and the then-Cocoa Coconut Institute (today the Cocoa Board and KIK), and the balance through provincial governments.[51,52] OPIC's extension budget exceeded that of DAL, was double that of FPDA, and far exceeded the other commodity boards. Overall, government support to the agriculture sector has declined over the decade. There are no clearly-defined boundaries regarding respective roles and responsibilities between DAL and the commodity boards. In general, the commodity boards are responsible for providing services for export products, while DAL supports the provision of services to subsistence and other cash income products. The performance of these agencies, particularly concerning extension services, are explored in the following section.

[48] In 1998, after the conclusion of the El Niño, coffee production spiked instantaneously as there was an increase in the number of coffee flowers because of the dry conditions, however, had El Niño lasted longer than six months then the coffee flowers would have perished.
[49] Bank of Papua New Guinea.
[50] ANZ 2019.
[51] Sitapai 2012.
[52] These amounts exclude district funding provided through the District Services Improvement Program, the bulk of which come from Constituency Development funds.

46. **The Medium-Term Development Plan provides high-level support for the agriculture sector.** The government's strategies and plans for economic and national development stem from the five policy priorities of its development agenda, the Alotau Accord II. During its previous term, the government also adopted the Strategy for Responsible Sustainable Development (StaRS), which gave prominence to the principles of a responsible, sustainable development agenda. The goals and ideals underlying StaRS are being elevated and actioned through the Medium-Term Development Plan for 2018–22 (MTDP III), which has the overall goal of "securing [the] future through inclusive, sustainable economic growth."[53] MTDP III builds on two previous MTDPs (covering 2011–17) and reflects the principles of PNG Vision 2050 and the PNG Strategic Development Plan 2010–30. Agriculture is listed as a priority, including the production of staple crops to increase food security and the promotion of commercial crops to increase incomes, and the MTDP II envisions a changing relationship between the public and private sectors through closer partnerships. MTDP III's financing for the economic sector, which includes agriculture, is 10 percent of total investment (up from 5 percent in previous plans).

[53] MTDP III has eight Key Result Areas (KRAs). KRA 1: Increased revenue and wealth creation; KRA 2: Quality infrastructure and utilities; KRA 3: Sustainable social development; KRA 4: Improved law and justice and national security; KRA 5: Improved service delivery; KRA 6: Improved governance; KRA 7: Responsible sustainable development; KRA 8: Sustainable population.

Constraints on cash income differ from those affecting subsistence activities in the agriculture sector. Photo: Allan Tobalbal Oliver.

## 2. Myriad constraints impact on rural livelihoods

47. **Sector constraints impact different agricultural activities in various ways.** The nature and extent of these constraints differ from product to product. The lack of infrastructure and services, such as transport, is more of a challenge with perishable products especially where these are shipped into the major markets of Lae and Port Moresby. Low productivity tends to be a constraint in the case of export products but not—or at least much less so—in the case of subsistence and other cash income products. Limited financial services are a general problem, while a lack of access to loan finance is usually more problematic where significant investment is required, for example, in equipment to process export and value-added products. Demand for extension services is generally higher for cash income products, which is met at least in part by the commodity boards for export products. However, a largely inoperable DAL means that other products miss out. Limited market access and marketing services are a challenge, especially for local enterprises producing value-added products for sale in the domestic market. Climate threats have the potential to impact coconut production as altitudinal limits shift, while export products such as coffee and cocoa are more susceptible to disease. The lack of law and order is problematic for any product where money changes hands, but more so for women selling, for example, fresh foods, given their higher vulnerability to crime. The broader context and specific nature of these issues are examined in more detail in this section.

### *(i) Infrastructure and services*

48. **Transport infrastructure and services hamper the performance of the agriculture sector.**[54] With a topography that rises 4,500 meters above sea level, providing road, air, land or sea transport is a significant challenge (especially in rural areas). In 2002, 53 percent of the population lived within 5 km of a national road. The condition of these roads has improved; 46 percent of national priority roads were in good condition in 2011, up from 33 percent in 2007. However, more than 75 percent of national, district, and rural roads are impassable during some part of the year. The poor condition and lack of adequate maintenance of roads makes moving products both problematic and expensive. High-volume export products such as cocoa, coffee, and copra, are especially impacted, where producers can end up paying as much as 30 percent of the total value of the product in transport costs. Also, for some of the fresh food products, such as sweet potatoes being transported to major markets in Lae and Port Moresby, post-harvest losses range between 5 and 25 percent.[55] In addition to the 22 airports, there are hundreds of rural airstrips spread throughout the country. Deteriorating rural airstrips, combined with high costs, mean that domestic air services are not a viable option for transporting products suitable for air travel (such as fresh foods). For the 60 percent of the population that reside along the coastline and waterways, small boats and ferries are the main means of transport; these can be unreliable and expensive. Deteriorating maritime infrastructure, such as small docks, along with high costs, means that sea transport is not a viable option for transporting products.

49. **Energy resources are abundant although the sector performs poorly with many rural areas of the country not serviced.** Papua New Guinea has underutilized hydropower potential as well as solar, natural gas, geothermal, and other resources. Despite this energy abundance, Papua New Guinea is the least energy-intensive economy in the APEC region.[56] Demand for electricity is rising, with economic growth driving an average increase in consumption of 2.6 percent per annum. Assuming annual population growth of 3 percent, this translates into an increase in electricity demand of about 5.6 percent per annum. Energy infrastructure is aging and poorly distributed, and there is only limited coverage in rural areas. The government infrastructure development push of the 1980s intended to electrify rural areas; however, very little remains operational. For export products such as cocoa and copra there is no obvious demand for electricity, while for value-added products such as virgin coconut oil (using electrical scrapers) or spices (using grinders), electricity is a necessity. Processors will sometimes rely on petrol- or diesel-run generators, or solar power, but these can be costly, unreliable, and expensive to repair in case of breakdowns.

50. **While Papua New Guinea lags its peers on telecommunications, the mobile network and Internet are critical in rural areas.** Mobile coverage and internet access are expanding rapidly. Over the decade to 2017, the percentage of the population with mobile phone subscriptions has increased by roughly 40 percentage points and internet usage by around 10 percentage points. However, Papua New Guinea compares poorly with peer economies,[57] where approximately 30 percent of the population have mobile phone subscriptions (compared with just over 11 percent in Papua New Guinea) and about 90 percent use the internet (compared with around 49 percent in Papua New Guinea).[58] Access to information via the internet has become an essential and valuable default option in the absence of extension services. In the case of value-added products like virgin coconut oil and spices, information on processing, production, and marketing is often taken from

[54] Bourke and Harwood 2009; and Lawrence 2018.
[55] Bourke and Kanua 2017.
[56] Lawrence 2018.
[57] Peer economies are Bolivia, the Republic of Congo, Ghana, the Lao People's Democratic Republic, Mauritania, Mongolia, Nigeria, Uzbekistan, and Zambia. They constitute peers based on their similarities to Papua New Guinea in terms of gross national income (GNI) per capita and the size of their mineral and petroleum resources relative to GDP. See Box 1 of the December 2017 edition of the *PNG Economic Update* for a detailed discussion.
[58] World Development Indicators, 2017.

the internet. Rural villagers seeking information about these sorts of products appear to rely heavily on virtual ("google") services, where available, rather than conventional extension services.

### *(ii) Productivity and production*

51. **For Papua New Guinea's main export products, yields are stagnant or declining, and production is facing competition from other crops.**[59,60] Except for oil palm and sugar cane, yield data is limited in Papua New Guinea. For oil palm, yields have fallen from a high of 20 tons per hectare in 2011 to just over 16 tons per hectare in 2016, due mainly to unfavorable (dry) weather conditions in the country's oil-producing regions.[61] For rural villagers or smallholders, yields are in general significantly lower than for plantations, both for oil palm and for coffee and cocoa (Table 6). Also, sizable gaps exist between average crop yields and the genetic potential yields of improved planting materials; these are more pronounced in the case of smallholders. For example, the current average yield of coffee is 600 kilograms per hectare (kg/ha) which is 70 percent below the genetic potential, cocoa is 366 kg/ha which is almost 88 percent below the genetic potential, and copra is 900 kg/ha which is 32 percent below genetic potential. For cocoa, the 2008 cocoa pod borer infestation and its subsequent impact on production reduced yields further. In the case of production, in some areas rural villagers are replacing coffee with higher earning fresh products such as carrots, broccoli and sweet potato, and similarly, replacing cocoa with higher earning vanilla.[62]

**Table 6. Yields of Plantation and Smallholder Coffee, Cocoa, and Oil Palm, 1961–2007**

| Crop | Smallholders | | Plantations | |
|---|---|---|---|---|
| | Range (kg/ha) | Average (kg/ha) | Range (kg/ha) | Average (kg/ha) |
| Arabica coffee (green bean) | 750 – 1,170 | 947 | 1,050 – 2,360 | 1,645 |
| Cocoa (dry bean) | 80 – 629 | 284 | 440 – 600 | 535 |
| Copra | 400 – 1,210 | 556 | 710 – 1,000 | 862 |
| Oil palm | 5,900 – 18,500 | 10,650 | 18,900 – 21,400 | 20,417 |

*Source:* Bourke and Harwood 2009.

### *(iii) Finance and services*

52. **Although some progress has been made in extending finance and services, access remains low, especially in rural areas.** A broad spectrum of informal[63] and formal financial organizations[64] provide services, but physical access points are concentrated in urban areas. Papua New Guinea has one of the lowest levels of financial service access point density (that is, branches, agents, and automated teller machines) in the world. While the increase in telephone subscriptions (see above) offers a potential solution, by expanding access to mobile phone banking, the capacity for mobile banking remains low in rural areas, especially among women.[65] Access to loan finance is also problematic. The majority of rural villagers engage in agriculture activities on customary land which, owing to uncertainty around land tenure arrangements, means it is deemed ineligible to meet collateral requirements for loans. While savings groups have emerged, especially for women—expanding

[59] Bourke and Harwood 2009.
[60] Omuru and Anis 2012.
[61] Ian Orrell, New Britain Palm Oil Limited (Group).
[62] Inu 2015; and Hetzel 2018.
[63] There is limited information on informal financial institutions although money lenders appear more common in urban areas and store credit is an important form of short-term finance in rural areas.
[64] Including three commercial banks (Australia and New Zealand Banking Group, Bank South Pacific and Westpac Bank Corporation), 21 savings and loans societies, five microfinance institutions, eight finance companies, seven money changers, and one credit bureau.
[65] Sibley 2015.

access to affordable loans for education fees and medical bills as well as investment in income-earning opportunities—these deal with relatively small sums of money. Loan finance is needed, where significant financial investment is required (as in the case of an export or value-added product business). A considerable investment is needed, for example, to purchase or refurbish fire-powered or solar drying units for cocoa and copra; similarly, a sizable investment is needed to purchase processing machinery such as scrapers, drying and storage facilities, oil presses, and so on, for the production of virgin coconut oil. Loan finance is also needed for inputs, such as improved planting materials, which contribute to increasing productivity of export products especially coffee and cocoa. The lack of access to affordable finance acts as a major constraint to the performance of these productive activities.

### *(iv) Extension services*

53. **The provision of extension services is extremely limited in Papua New Guinea.**[66] There are two possible explanations for this situation. On the one hand, a complex and poorly understood organic law,[67] which governs the relationship between the national, provincial, district, and local governments, impedes the provision of services, including extension services. On the other, and more generally, the practice of appointing unqualified personnel, motivated by political gain or nepotism, creates conditions which make policy development and implementation unworkable. Whatever the reason, the result is that the provision of services in general and extension services, in particular, is minimal. National staff are isolated from provincial staff who are in turn isolated from district staff. There are confusing lines of authority, reporting, and responsibilities between the different levels of government, and, as a result, most government services struggle to function. There is also considerable confusion over financial responsibilities, resulting in delays in the arrival of funds, exacerbating the situation. Commodity boards conduct their own extension, although this is limited in scope and confined mainly to those involved in export products. In general, rural villagers in Papua New Guinea sustain themselves rather than relying on government institutions for support. Civil society and non-governmental organizations have stepped in to fill the void, and there are some initiatives such as the Pacific Horticulture and Market Access (PHAMA) program's establishment of industry working groups (for cocoa, coffee, high value products, fresh produce and handicrafts) that have proven successful in leveraging public and private sector services, but in general they often lack capacity and resources and sometimes compete with government agencies for funding.[68] There have been efforts by DAL to address the shortcomings of commodity boards and other organizations in the agriculture sector, most recently in the form of the Functional and Expenditure Review (FER).[69] A major recommendation of the FER was for there to be greater coordination between organizations to improve the delivery of services, including extension services in the agriculture sector. However, there is little evidence of any substantive reform in the agriculture sector, with much of the advice of the FER having been either overlooked or ignored.

### *(v) Market access and marketing services*

54. **Market access and marketing services are particularly limited for value-added products in the domestic market.** Market access involves linking producers with buyers while marketing services include packaging, labeling, meeting informal or formal market standards, and other services that facilitate the sale of products. Value-added products such as virgin coconut oil and spices span mainly domestic supply chains; spices are sold mostly in small amounts in local markets. These stand in stark contrast to export products—which are well-established, span domestic and international supply chains and, except for small niche markets for processed coffee and cocoa, are sold in large volumes to bulk buyers. In the case of virgin coconut oil and

[66] Bourke and Harwood 2009.
[67] The Organic Law on Provincial Governments (1976) and the subsequent Organic Law on Provincial and Local Level Government (1995) provided decentralisation to the provinces and districts.
[68] PHAMA 2017.
[69] Department of Agriculture and Livestock 2014.

spices, while there are a handful of more-established enterprises, most are produced by rural villagers who struggle to connect with bulk buyers and resort to selling only small amounts through formal channels (such as traditional markets, roadside stalls, family, and friends). In this case, products are often packaged in recycled containers, such as soft drink or water bottles, quite often without labels, and their quality varies considerably. The PHAMA program provides market access and marketing services for niche coffee and cocoa producers, as well as for virgin coconut oil (Box 5) and spice (Box 6) enterprises. However, the program is exclusively for export development; there is currently no equivalent service supporting market access and marketing services for value-added products in the domestic market.

### *(vi) Climate change, pests, and diseases*

55. **Early signs of climate change impacts on agriculture are emerging and, although uneven, are predicted to increase in the coming decades.** Rising sea levels and temperatures, and to a lesser extent rainfall, are providing evidence of climate change in Papua New Guinea. In coastal areas of Bougainville, there are cases of seawater intrusions, which damage crops with mildly brackish water.[70] In highland areas, rising temperatures are shifting the extreme upper altitudinal limits for coconuts, from 1,320 meters altitude in the 1970s to 1,560 meters attitude in 2009 and 1,620 meters altitude in 2016.[71] Scientific predictions to 2030 project the sea level in the western Pacific to rise by 40–50 millimeters, the monthly mean air temperature in Papua New Guinea to increase by around 0.9 degrees Celsius (°C), and the mean annual rainfall in Papua New Guinea to increase by around 8 percent.[72] The impacts of climate change on both subsistence and cash-income agriculture are likely to be mixed with rising temperatures, for example, allowing some crops to be grown above their current upper altitudinal limit and others to be grown below their lower altitudinal limit. Among staple foods, while the predicted 0.9°C increase in temperature by 2030 is unlikely to impact sweet potato production, an increase in rainfall might cause some reduction, especially in heavy clay soils. The possible impact on sweet potato is particularly significant given that most villages are engaged in its production and it is the main source of food for rural villagers. Coffee and cocoa, which are important contributors to both local livelihoods and the national economy, are likely to be more susceptible to the occurrence of diseases, which would reduce production.[73] Accelerated by climate change, and as the result of new weather patterns, pests and diseases such as the coffee berry borer (CBB) will pose a serious threat. Discovered in Papua New Guinea in 2017, left untreated CBB can cause losses of 30-35 percent and 100 percent of all coffee cherries infected.[74]

### *(vii) Law and order*

56. **Rural livelihoods, especially those of women, are negatively impacted by the country's limited success in dealing with high crime rates and disruptions to law and order.** High rates of crime, commonly robbery, grievous bodily harm, and stealing, are reported in the main urban centers of the National Capital District and Lae, but they are also prevalent in rural areas, especially New Britain and certain Highlands provinces.[75] In addition to adverse social impacts, high crime rates also present a significant obstacle for the agriculture sector. Producers and traders, using national as well as the small district and rural roads, are vulnerable to robbery and assault. Criminal targeting, especially of the key logistics routes such as the Highlands Highway, impedes the transport of goods. The use of private security services is common; however, these services are concentrated in urban areas and are well beyond the means of most rural villagers. Opportunities for women to benefit from cash income opportunities in agriculture are constrained by their relatively higher vulnerability to crime, involving not only robbery, but also serious sexual assault, beatings, intimidation, and so

[70] Bourke and Bettis 2003.
[71] Bourke 2018.
[72] Australian Bureau of Meteorology and Commonwealth Scientific and Industrial Research Organization 2011.
[73] Bourke and Bettis 2003.
[74] Bittenbender and others 2018.
[75] Lakhani and Wilman 2014.

on. This threat can restrict the ability of women to work in the many fresh food markets common throughout rural and urban areas of the country, limiting their ability to earn an income.

The best prospects for securing sustainable rural livelihoods will come from championing diversification and partnerships in the agriculture sector. Photo: Dan Vadnjal.

## 3. Boosting cash income activities will contribute to sustainable rural livelihoods

57. **There are considerable opportunities for securing more sustainable rural livelihoods.** Rural livelihoods are deemed sustainable when villagers can cope with and recover from the sorts of challenges described in the previous section, and they can enhance their income-earning opportunities and other assets without undermining their natural resource base. Although subsistence agriculture activities cushion the impacts of challenges in the agriculture sector, boosting cash income opportunities is a more effective way of fostering sustainable rural livelihoods. Papua New Guinea's diverse agriculture makes this possible, as does the wide array of existing and emerging cash income activities. Building supply-chain partnerships can harness these opportunities effectively.

58. **Diversification in agriculture activities is crucial to securing sustainable rural livelihoods.** Traditionally, in addition to staple foods, rural villagers have also engaged in the production of coffee, fresh food, betel nut, and cocoa along with other products including copra and livestock. Alongside these traditional products, livestock, high-value coconut, spices, and other products such as galip nut are on the rise and are shown to provide positive returns. The benefits accruing to processors of virgin coconut oil are significant in terms of returns to labor; these are estimated at between K 28-35 per day, depending on price, which compares favorably with a shadow price of labor of K 20 per day.[76] The benefits accruing to spice growers are also

[76] Vadnjal and Sitapai 2019.

significant in terms of returns to labor. For spice growers, these are estimated at between K 52-61 per day, depending on price, which also compares favorably with the shadow price of labor.[77] The benefits accruing to broiler farmers from selling live birds and pig farmers from selling live sows and boars are significant in terms of profit margins. Profit margins are estimated to be roughly 39 percent and 57 percent for broiler and pig farms, respectively.[78] Other than positive returns, the advantage of both of these products is that they provide relatively quick returns compared with tree crops.

59. **Integration of agriculture activities is also key to securing sustainable livelihoods.** In general, integrated farming is the practice of mixing activities—such as cash crops and livestock —to maximize income from different sources and complement land and labor demands throughout the year. Initiatives such as the Productive Partnerships in Agriculture Project (PPAP)[79] are promoting mixed farming and the integration of crops other than cocoa and coffee (Box 6). Examples include the integration of cocoa with galip nut trees or using gliricidia trees as shade, which in turn serve as support for vanilla vines. There are possibilities for including other spices, depending on the climate and soil conditions, including many spices. Other than raising incomes, mixed farming can provide rural villagers with an income cushion (one source can supplement the other in case of shocks), a source of protein in the case of livestock, and it can strengthen climate change resilience.

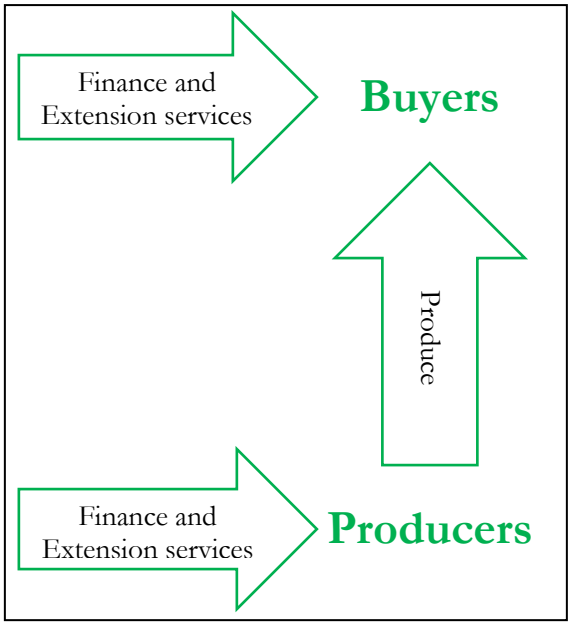
60. **Value-added products offer some of the most promising opportunities in agriculture.** High-value coconut products, especially virgin coconut oil, are beginning to emerge alongside traditional coconut and other products (Box 5). The supply chain comprises individuals or groups of rural villagers, and there are only several micro or small-sized enterprises that process and sell to the domestic and international market. Products are sold into supermarkets or specialty markets (such as pharmacies, hairdressers, hotels, restaurants, and cafes), and formal and informal rural and urban markets; a relatively small volume of exports is sold in both physical and virtual markets. For spices, the supply chain comprises mostly individuals or groups of villagers, although NARI supplies small volumes of chili cayenne and pepper, and there is one small to medium-size enterprise processing around 1,500 kg per month of the main spices which are then sold into the domestic market (Box 6). Although production is known to be widespread, spices are not exported, and there are no data on the total production or sales to the domestic market. Processed spices are sold through outlets that are both formal (hotels, restaurants, traditional markets) and informal (friends and family). Livestock comprises both small through to large-size enterprises, with relatively complex supply chains. The chicken and pig population has risen sharply, jumping to about 4.5 million and 2.1 million, respectively.[80] In the case of both chickens and pigs, live animals as well as fresh and frozen meat are sold into urban and rural markets and are also used for self-consumption.

61. **Supply chain partnerships are an effective way to harness cash income opportunities in agriculture.** Modes of service delivery that rely on governments provide only limited extension services at best. Given the state of institutional disarray, this is especially so in Papua New Guinea. An alternative to conventional public sector service delivery that is gaining traction in Papua New Guinea and other economies in East Asia and the Pacific involves supply chain partnerships. A simplified and stylistic presentation of the conventional and new partnership modes of service delivery is presented in Figure 31.

[77] Vadnjal and Sitapai 2019.
[78] Draaijer 2018.
[79] World Bank 2010.
[80] There is also a small duck population of about 18,000 animals (FAOSTAT).

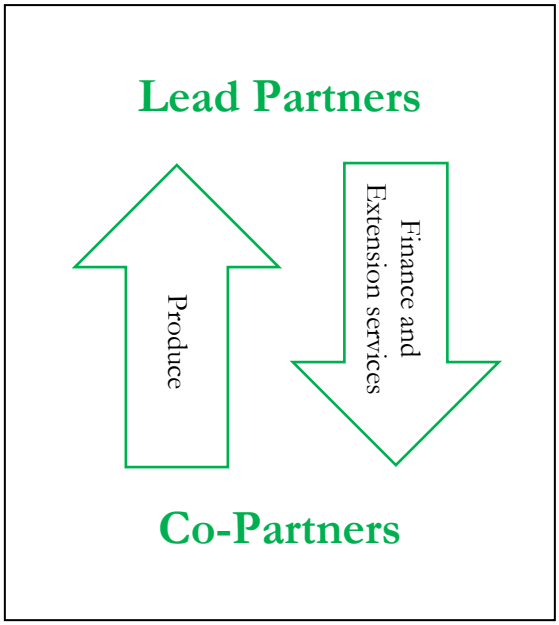
**Figure 31. Modes of service delivery in the agriculture sector**

***The conventional …***




In the conventional mode, services are delivered separately to buyers and producers. In Papua New Guinea, respective commodity boards have focused on providing services mainly to a handful of buyers (namely exporters) of coffee, cocoa, copra and copra oil, and palm oil, while DAL has supported the provision of services to rural villagers or producers.

***… and the new***




In the partnership mode, services are delivered together by lead partners (exporters) to co-partners (rural villagers). Examples in Papua New Guinea include the PPAP, which provides services to rural villagers engaged in coffee and cocoa, and its successor, the Agriculture Commercialization and Diversification Project (PACD).

62. **Papua New Guinea has adopted the PPAP mode of service delivery and will deploy its replacement, the Agriculture Commercialization and Diversification Project (PACD).** The PPAP has been providing services to rural villagers engaged in coffee and cocoa since the start of this decade. Its successor, the PACD, will expand the range of commodities to include high-value coconut products, spices, and livestock.[81] The PPAP approach includes a partnership between the private sector comprising rural villagers as "co-partners" and one or more buyers as "lead partners," and the public sector represented by DAL and the two commodity boards representing coffee (CIC) and cocoa (CB). These partners are linked through a "business plan" which describes the financial and technical provisions of the partnership. The partnership model has significant advantages versus the conventional mode of service delivery in the agriculture sector as it addresses at least some of the core challenges pertaining to cash income activities presented in the previous section. It leverages the technical and financial resources of the private sector, opens up the possibilities for public-private cost sharing on delivery and, crucially, provides rural villagers with access to established markets.

[81] World Bank 2018a.

It also opens the door to innovations, such as supply chain financing, where pre-financing of co-partners' investments in equipment and machinery can be repaid upon sale of produce to lead-partners.

## Box 6. Spicing up rural livelihoods

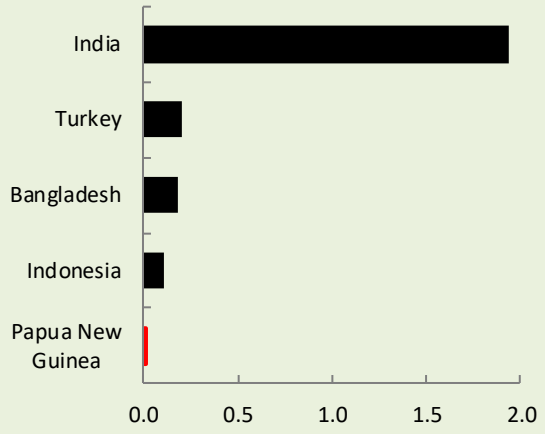
*Building supply chain partnerships to boost spice production*

**Following the rise and fall of chili and cardamom exports, there has been a resurgence in domestic production and sales in recent years.** In the early 1980s, Papua New Guinea was exporting more than 250 tons/year of "birds-eye" chili and by the late 1980s exports of cardamom was close to 400 tons/year. Problems with the provincial government buying system and a decline in world prices, however, resulted in a sharp decline, and by the mid-1990s exports were close to zero. Today, except for vanilla, there are little if any spice exports; however, a resurgence in domestic production of a range of spices is taking place. Production (that is, growing spice through to grinding the powders) is mainly by rural villagers, although Paradise Foods Limited (PFL), based in Port Moresby, has been sourcing spices for production. On average, PFL buys around 400 kg/month of ginger, 500 kg/month of turmeric, 15 kg/month of birds-eye chili, 200 kg/month of cayenne chili, 10 kg/month of cardamom, 200 kg/month of cinnamon and 300 kg/month of nutmeg. Pepper and nutmeg are supplied by the National Agricultural Research Institute (NARI), and chili (cayenne) is supplied by a commercial grower, while the remaining spices are grown mainly by rural villagers. Those produced by rural villagers tend to be sold through a combination of established outlets such as hotels, restaurants, and traditional markets as well as through family and friends, while PFL supply several main supermarkets.

**Prospects for future growth are positive, supported by rising demand reflecting the perceived health benefits of spices.** Global consumption of spices is expanding steadily with growth rates in the region of 2 to 5 percent per annum; the global market for spices is projected to exceed US$16 billion by 2019 (TMR, 2015). While Papua New Guinea ranks 54th globally for production (Figure 32) the country has the potential to take advantage of future growth.

**Figure 32. PNG is currently a minor producer of spices, but there is potential for growth**

(Tons, millions)




*Source:* Factfish.

**The Pacific Horticultural and Agricultural Market Access (PHAMA) program is working in partnership with PFL to enable the company to access export markets.** PHAMA-supported trial shipments of PFL spices to Australia and New Zealand have generated buyer interest, PFL is already planning to export vanilla into New Zealand and Australia and possibly the United Kingdom, and markets are emerging for turmeric, ginger, and cardamom in other parts of the world. Considerable untapped potential also exists to build partnerships between major buyers and potential exporters like PFL and rural villagers, taking the same approach introduced by the World Bank in the PPAP. Under the program rural villagers partner with buyers to supply coffee and cocoa in return for financial and technical assistance. It is a win-win arrangement, with buyers benefitting from improved quality and quantity, and rural villagers benefiting from increased incomes. Building these sorts of supply chain partnerships would benefit the spice industry, buyers and suppliers alike.

## 4. A call to action

63. **Greater institutional coordination and capacity will be required to secure sustainable rural livelihoods in food and agriculture.** The institutional complexities in the agriculture sector are well recognized and thoroughly addressed in the 2014 Functional and Expenditure Review. The lack of coordination between national, provincial and district organizations, the numerous commodity boards, and the civil society and non-governmental organizations is an area requiring attention. The PPAP and the follow-on PACD provide an innovative solution by building partnerships between the public sector (comprising DAL, CIC, and CB) and the private sector (rural villagers and buyers). This mode of service delivery has the advantage of, rather than relying on the public sector, drawing on the technical and financial capacity of buyers or lead partners. The PPAP has proven to perform well for coffee and cocoa, and there are similar expectations for PACD with the inclusion of high-value coconut products, spices, and livestock. For the future, authorities could encourage this mode of delivery for other cash income activities including fresh food products. For subsistence products, the authorities could consider several possibly complementary options. On the one hand, improving coordination between and building capacity of DAL at the national, provincial, and district organizations to provide extension services targeted at subsistence agriculture, and, on the other hand, exploring the possibility of delivering these services through lead partners alongside those targeted at cash income agriculture. Inevitably, institutional coordination and capacity building, involving both the public and private sector, will not only be more effective in terms of impacting on rural livelihoods, but it will also be more efficient in reducing delivery costs.

64. **Innovative policy solutions will also be required to secure sustainable rural livelihoods in food and agriculture.** A broad policy consensus exists in the sector on the need to focus on both subsistence and cash income agriculture activities, as articulated in the MTDP III. The move from the PPAP's focus on the two main export crops (coffee and cocoa) to PACD's inclusion of high-value coconut products, spices, and livestock, is an important innovation as it contributes to enhancing the livelihoods of rural villagers. Diversification, especially where this involves rural villagers engaged in a mix of agriculture activities, is important because it provides an income cushion whereby one source can supplement another in the case of shocks. The authorities should focus on expanding the range of possible activities to include not only primary products such as fresh foods but also support to the many subsistence products on which rural villagers rely to sustain their livelihoods. Subsistence agriculture activities are important because they provide rural villagers with food security when cash income activities are limited. Inevitably, given the vastness of Papua New Guinea, this will require institutional coordination, not only for reasons of effectiveness and efficiency but also to ensure a wider distribution of benefits for rural villagers.

# Annexes

## Annex 1 and References

## Annex 1. Selected Economic and Social Indicators

| | 2014 | 2015 | 2016 | 2017 Est. | 2018 Est. | 2019 Projections | 2020 Projections | 2021 Projections |
|---|---|---|---|---|---|---|---|---|
| **National income and prices** | *(In percent, unless otherwise indicated)* | | | | | | | |
| Nominal GDP (US$ billions) | 23.2 | 21.7 | 20.8 | 22.4 | 23.3 | 23.4 | 25.3 | 27.5 |
| Real GDP growth, *of which:* | 13.5 | 9.5 | 4.1 | 2.7 | -0.5 | 5.6 | 3.1 | 3.5 |
| Extractive sector (percentage-point contribution) | 10.0 | 12.8 | 2.4 | 1.4 | -2.5 | 3.8 | 0.5 | 0.4 |
| Non-extractive (percentage-point contribution) | 3.5 | -3.4 | 1.7 | 1.4 | 2.0 | 1.9 | 2.5 | 3.1 |
| Consumer price inflation, period average | 5.2 | 6.0 | 6.7 | 5.4 | 4.5 | 4.4 | 4.8 | 5.0 |
| GDP deflator | 5.5 | -3.9 | 3.9 | 6.8 | 8.0 | -1.8 | 4.1 | 3.2 |
| Real exchange rate change, US$/PGK* | -5.6 | -5.9 | -6.9 | 1.4 | -1.2 | -0.6 | 3.3 | 5.0 |
| **Fiscal accounts** | *(In percent of GDP, unless otherwise indicated)* | | | | | | | |
| Revenue and grants | 20.8 | 18.3 | 16.1 | 16.2 | 18.4 | 17.6 | 17.1 | 16.7 |
| Non-resource tax revenue | 16.5 | 14.9 | 12.8 | 12.7 | 12.7 | 13.0 | 13.1 | 13.0 |
| Resource revenue | 2.3 | 1.1 | 0.6 | 0.9 | 1.9 | 2.0 | 1.4 | 1.3 |
| Grants and other revenue | 2.0 | 2.3 | 2.7 | 2.6 | 3.9 | 2.6 | 2.6 | 2.4 |
| Expenditure and net lending | 25.4 | 22.4 | 20.9 | 18.7 | 21.0 | 20.3 | 19.0 | 18.2 |
| Primary expenditure | 23.7 | 20.6 | 18.9 | 16.4 | 18.5 | 17.8 | 16.5 | 15.9 |
| Interest payments | 1.7 | 1.8 | 1.9 | 2.3 | 2.5 | 2.5 | 2.5 | 2.3 |
| Overall fiscal balance | -4.6 | -4.1 | -4.7 | -2.5 | -2.7 | -2.7 | -1.8 | -1.5 |
| Non-resource primary balance (% non-extractive GDP) | -6.6 | -4.5 | -4.5 | -1.6 | -2.7 | -2.9 | -1.0 | -0.6 |
| Net public debt | 26.9 | 30.1 | 33.2 | 33.3 | 34.2 | 36.1 | 35.4 | 34.3 |
| Gross government debt | 26.9 | 30.3 | 34.6 | 34.4 | 36.8 | 38.9 | 37.6 | 35.2 |
| Gross government savings | 0.0 | 0.1 | 1.4 | 1.0 | 2.6 | 2.8 | 2.2 | 0.8 |
| **External accounts** | *(In millions of U.S. dollars, unless otherwise indicated)* | | | | | | | |
| Exports, f.o.b., *of which:* | 8,907 | 8,425 | 8,202 | 9,958 | 10,023 | 9,992 | 10,421 | 10,662 |
| Extractive sector | 7,349 | 7,199 | 6,730 | 8,335 | 8,737 | 8,688 | 9,019 | 9,211 |
| Imports, c.i.f. | -3,979 | -2,687 | -2,478 | -3,437 | -2,861 | -3,029 | -2,999 | -3,356 |
| Current account | 2,251 | 4,141 | 4,614 | 4,907 | 5,822 | 5,222 | 5,575 | 5,283 |
| (in percent of GDP) | 9.7 | 19.1 | 22.2 | 21.9 | 25.0 | 22.3 | 22.1 | 19.2 |
| Overall balance of payments | -520 | -440 | -184 | 54 | 491 | 107 | 291 | 205 |
| Gross official reserves | 2,305 | 1,865 | 1,681 | 1,736 | 2,227 | 2,334 | 2,625 | 2,831 |
| (in months of goods and services imports) | 6.8 | 6.0 | 3.9 | 4.8 | 5.9 | 6.1 | 6.1 | 6.0 |
| (in months of non-extractive imports) | 17.1 | 19.3 | 10.6 | 11.9 | 14.5 | 15.6 | 17.0 | 17.8 |
| **Money and credit** | *(In percent, unless otherwise indicated)* | | | | | | | |
| Broad money growth | 3.4 | 8.0 | 10.9 | -0.9 | 8.7 | -1.7 | 5.9 | 4.4 |
| Domestic credit growth | 23.5 | 15.8 | 24.6 | -0.1 | -0.9 | 3.9 | 3.9 | 3.8 |
| Growth of credit to the private sector | 3.5 | 3.4 | 7.2 | -3.8 | 6.0 | 6.8 | 5.3 | 4.7 |
| Interest rate of 182-day T-bills, period average | 5.3 | 7.1 | 7.4 | 7.1 | 7.0 | 7.9 | 8.5 | 8.7 |
| **Social indicators** | | | | | | | | |
| Population, total (millions) | 7.9 | 8.1 | 8.3 | 8.4 | 8.6 | 8.8 | 8.9 | 9.1 |
| Population growth (percent) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.9 |
| Life expectancy at birth (years) | 65.2 | 65.4 | 65.5 | 65.7 | .. | .. | .. | .. |

*Sources:* Official data; World Bank staff estimates and projections.
*Note:* * An increase represents appreciation and a decrease is depreciation.

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