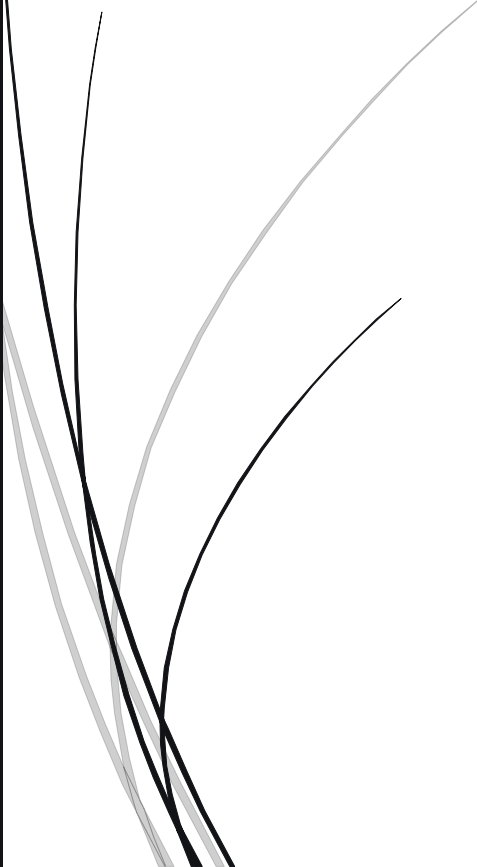




May 2018

Landscape of Climate- Relevant Land- Use Finance in Papua New Guinea

A review of financial flows related to
land-use mitigation and adaptation



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1 Introduction

Papua New Guinea (PNG) is a high forest cover country with high rates of deforestation and forest degradation.¹ PNG's forests are under pressure from a range of drivers including logging, commercial agriculture, subsistence (garden) agriculture, and mining.² Deforestation and forest degradation is estimated to release around 31.6 million tonnes of carbon dioxide (MtCO₂) / year, more than all other sectors in PNG combined. Deforestation and forest degradation also contributes to habitat loss for critically endangered species, and decreases the resilience of forests to drought, floods, and pests, which are predicted to become more intense with climate change.³

To address these issues, PNG has developed and endorsed a National REDD+ Strategy (NRS), which marks a critical step in the country's development process towards better management of its forest resources. Further action is needed, however, including the establishment of long-term, sustainable financing strategies to support the policies and measures outlined in the Strategy. In that light, the government of PNG is developing its REDD+ Finance and Investment Plan (RFIP) that will provide a detailed breakdown of activities to be undertaken in the coming five years, including clear budgets and approaches to financing.

To inform this process, this paper maps out existing sources of land-use finance in PNG - including the identification of finance that is aligned with climate change outcomes, i.e. that contributes to conserving forests, or planting new forests (so-called 'green' finance), and finance that is currently contributing to emissions from deforestation and forest degradation ('grey' finance). This paper maps out revenues and expenditures - both qualitatively and quantitatively - that have an impact on forest carbon stocks, including finance from the domestic government budget, private sector and international financial and technical partners.

1.1 Overview of land use, and land use change in PNG

According to recent data collected for PNG's national forest reference level⁴ submission to the United Nations Framework Convention on Climate Change (UNFCCC), forests cover 36 million ha (78.1%) of PNG's total land area (46 million ha).⁵ The remaining area is a mixture of cropland (5 million ha), grassland (2.6 million ha) and wetlands (2.1 million ha). More than three quarters of the forested area (27.7 million ha) is still primary (undisturbed) forest, while the remaining

¹ da Fonseca, Gustavo A. B., et al. No Forest Left Behind. PLoS Biology, vol. 5, no. 8. pp. 1645

² Papua New Guinea's National REDD+ Forest Reference Level. Submission for UNFCCC Technical Assessment in 2017
http://redd.unfccc.int/files/png_frl__submission-15.01.2017.pdf

³ Shearman, P.L., Bryan, J.E., Ash, J., Hunnam, P., Mackey, B. and Lokes, B., 2008. The state of the forests of Papua New Guinea. *University of Papua New Guinea, Port Moresby.*

⁴ Papua New Guinea's National REDD+ Forest Reference Level. Submission for UNFCCC Technical Assessment in 2017
http://redd.unfccc.int/files/png_frl__submission-15.01.2017.pdf

⁵ Forests in PNG are defined as "land spanning more than 1 hectare, with trees higher than 3 meters and the canopy cover of more than 10 percent (%)"

forest shows some sign of disturbance through logging (10%), gardening (8.2%), fire (3.1%) or other degradation (1.5%) (see Figure 1).

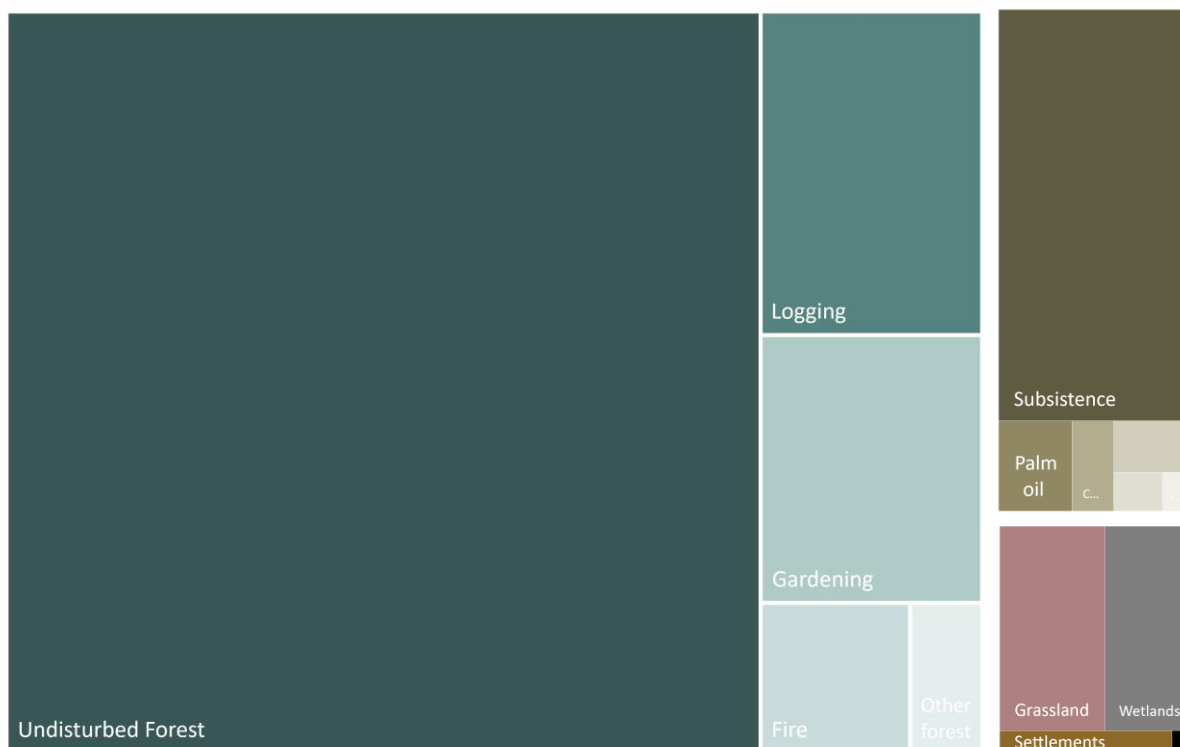


Figure 1 Land use in PNG in 2013, based on IPCC categories (forestland = teal, cropland = brown, grassland = red, wetlands = grey, settlements = tan, other = black) (Papua New Guinea Forest Authority Collect Earth Assessment).

Forests that have been converted to croplands are now predominantly small-scale or “garden” agriculture, which combined covers around 4.2 million ha, followed by cash crops, namely oil palm (0.4 million ha), coconut (0.2 million ha), coffee (0.1 million ha), and cocoa (0.05 million ha). These crops are vital to support the growing economy of PNG (see Section 3: Contribution of land use to the economy in PNG), and to support domestic subsistence and livelihoods needs.

1.2 Land use emissions in PNG

Average annual emissions from deforestation and forest degradation for the period 2001 – 2013 are estimated to be 31.6 MtCO₂ / year. During this period a total of 194,026 ha (0.5%) of forests were cleared as a result of shifting cultivation (66%), and conversion of forests to palm oil (24%), cocoa (1%), coconut (1%) and other permanent croplands (6.5%).⁶ During the same period, a total of 2 million ha (5.5%) of forests were degraded, primarily as a result of

⁶ Equivalent to an average rate of deforestation of 14,891 ha (0.04%) / year, although in recent years deforestation increased significantly, up to 39,677 ha / year in 2013

unsustainable commercial logging practices (90%), as well as a combination of subsistence farming, fire, and small-scale logging (10%).⁷

Despite the lower emissions per hectare associated with forest degradation, the majority of historical emissions (86%) in PNG are a result of forest degradation (27.2 MtCO₂ / year), with deforestation emissions contributing less than a sixth of total emissions (4.4 MtCO₂ / year) (see Figure 2). Forest degradation due to commercial logging is the single largest source of emissions (24.3 MtCO₂ / year), followed by shifting cultivation (2.9 MtCO₂ / year) and palm oil expansion (1.1 MtCO₂ / year). Despite its high profile, the development of mining, and petroleum, has had a relatively small impact on forest cover within PNG. Indirect emissions resulting from the resettlement of people (both towards and away from mine areas) and the development of infrastructure to support mining operations, however, may be worth further analysis.

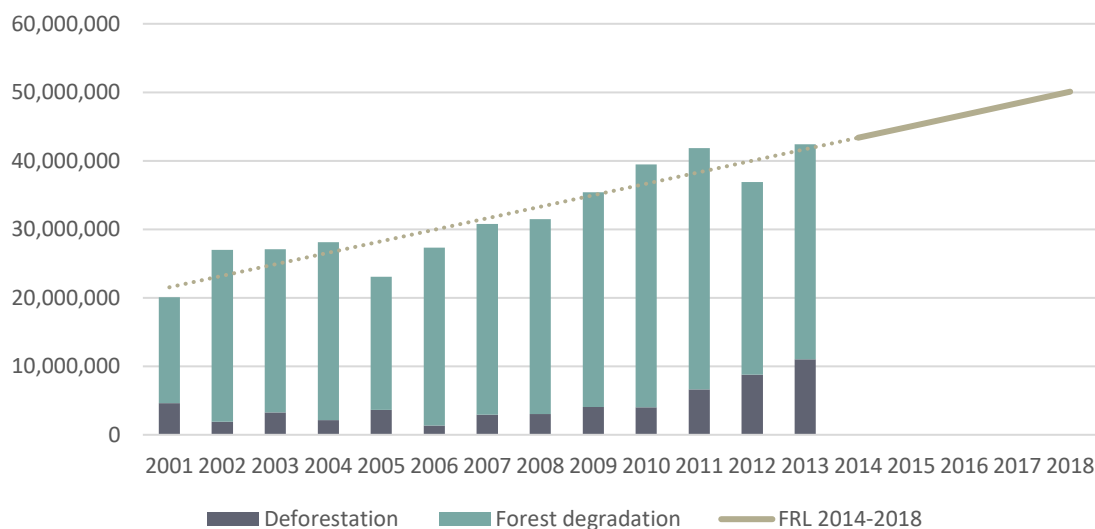


Figure 2 Emissions from deforestation and forest degradation for the period 2001-2013, and projected forest reference level from 2014-2018. Taken from Papua New Guinea’s National REDD+ Forest Reference Level. Submission for UNFCCC Technical Assessment in 2017 http://redd.unfccc.int/files/png_frl_submission-15.01.2017.pdf

1.2.1 Future trends in emissions from deforestation and forest degradation

While it is hard to project future land use emissions, based on historical trends, emissions from deforestation and forest degradation are likely to increase significantly in coming years, rising to more than double historical averages (50 MtCO₂ / year) by 2018 (see Figure 2). There appears to be little abatement in the production of major commodities that drive deforestation and forest degradation in PNG (see Section 3: Contribution of land use to the economy in PNG),

⁷ Equivalent to annual rate of degradation of 161,000 (0.45%) ha / year, with little variation year on year

and without interventions that drive low carbon development, these will have significant impacts on forest conditions in the future.

The commercial logging sector, the largest driver of forest emissions, is planned to continue and expand.⁸ There are currently over 8.6m ha of forest under concession in PNG, and the majority of timber permits will not expire until 2050.⁹ A further 8.4m ha have been identified for potential future development. Existing exploitation has focused on the New Guinea Islands and Southern region with future expansion proposed within the Southern and Momase regions (West Sepik, Oro and Western Province in Particular).¹⁰

Subsistence agriculture, the second largest driver of forest emissions in PNG covers an area of 3.2 million ha, with production closely linked to domestic consumption. With population increasing rapidly in PNG (3.1% per annum)¹¹, and per capita consumption also rising, deforestation due to family agriculture is also likely to increase. Expansion of subsistence agriculture is likely to be concentrated in forests degraded by logging, fire or other activities as well as along transport routes close to urban and peri-urban areas.

Commercial agriculture, the third major driver of emissions in PNG, is dominated by oil palm, which in 2013 covered an area of approximately 350,000 ha. Secondary cash crops, including cocoa, palm oil, coffee, and coconuts also contribute to deforestation and collectively cover an equivalent area of land. The PNG government has set ambitious plans for agricultural expansion, targeting a five-fold increase in agricultural production by 2030.¹² As of 2012, over 4m ha of forest land is allocated to Special Agricultural Business Leases (SABL), of which 800,000 ha have been issued a Forest Clearance Authority (FCA).¹³ Clearance of all SABL designated areas would result in emissions of 1.2 GtCO₂e, equivalent to around 30 years of emissions at current levels.¹⁴

This expansion is expected to come in part through an increase in yield of agricultural production by 60%, but the major gain is through a 180% increase in the area of land under cultivation. Based on current production area, this would mean an additional 1.3 million ha of land converted to cropland, which would conservatively result in an increase in emissions of 220 MtCO₂ over a 15-year period, i.e. a 50% increase in current emissions from commercial agriculture alone.¹⁵

⁸ Climate Change and Development Authority (2014) Issues and Options for REDD+ in Papua New Guinea

⁹ *ibid.*

¹⁰ *Ibid.*

¹¹ Papua New Guinea National Statistics Office (2016) <http://www.nso.gov.pg/index.php/population-and-social/other-indicators>

¹² Department of National Planning and Monitoring (2010) Papua New Guinea Development Strategic Plan 2010-2030

¹³ Climate Change and Development Authority (2014) Issues and Options for REDD+ in Papua New Guinea

¹⁴ Based on average historical emissions of 300tCO₂ / ha for clearance of forests to non-forest land.

¹⁵ Assuming new areas of production would come from degraded forests, with an emission factor of 171 MtCO₂ / ha.

2 Methodology

This paper maps climate-relevant land-use finance in PNG.¹⁶ The objective of the analysis is to identify financial flows that are aligned with land-use mitigation and adaptation activities that can be scaled up, as well as identify land-use finance flows that are not aligned with climate-change outcomes, and could be redirected towards more sustainable outcomes, or phased out.

In general, the analysis of climate-relevant land use finance is conducted in five stages as discussed further below (see Figure 3):



Figure 3 Five main steps conducted in this analysis.

2.1 Scoping and objectives of study

The scoping and objective of this assignment was determined through numerous national consultations held with a broad cross-section of stakeholders in PNG over the course of several missions (see

¹⁶ This methodology builds on a previous study conducted in Cote d'Ivoire and Climate Policy Initiative's general work on mapping climate finance. See <https://climatepolicyinitiative.org/publication/landscape-redd-aligned-finance-cote-divoire/> and <https://climatepolicyinitiative.org/publication/landscape-of-public-climate-finance-in-indonesia-3/> for examples of this work.

Annex II: Stakeholder consultations), and that long-term sustainable financing and management systems are put in place. To do this, this paper assesses current trends in climate-relevant land-use finance and identifies opportunities to scale-up and redirect existing climate-relevant land-use finance.

The scope of the study is limited to climate change mitigation related to land use, land use change and forestry (LULUCF) emissions.¹⁷ Agricultural emissions, including methane emissions from rice cultivation, and other emissions e.g. from grazing, and pesticide application, have been excluded from this analysis. Similarly, this study does not try to analyse climate change adaptation financial flows, as this is not a focus of the national REDD+ strategy, and nor do we want to duplicate other efforts focussing on climate change adaptation at the national level.¹⁸ Notwithstanding this, where there are joint mitigation and adaptation benefits these have been noted within our analysis.

Based on this scope, our study team created a working definition of climate-relevant land-use in PNG as outlined below.

2.2 Definition of climate-relevant land-use finance

This section describes the process of defining climate-relevant land-use finance in PNG. We first outline a general framework and typology, and then detail the steps taken to create a working definition of climate-relevant land-use finance in PNG.

2.2.1 Framework and typology of climate-relevant land use finance

Based on previous studies, climate-relevant land-use activities can be categorized into three broad categories (see Figure 4):¹⁹

Climate-aligned activities contribute to climate change mitigation by increasing GHG removals or decreasing GHG emissions from agriculture and forestry.²⁰ Examples of climate-aligned activities include afforestation / reforestation, zero deforestation agriculture, and clean cooking alternatives such as LPG, improved efficiency cookstoves, and induction cookers. These activities could be identified during an assessment of alternatives to address the drivers of deforestation and forest degradation, or through an analysis of opportunities to increase forest carbon stocks, e.g. through afforestation and reforestation programs.

¹⁷ This uses the categories and terminology of the IPCC 1996 Guidelines for National Greenhouse Gas Inventories and IPCC 2003 Good Practice Guidance for Land Use, Land-Use Change and Forestry

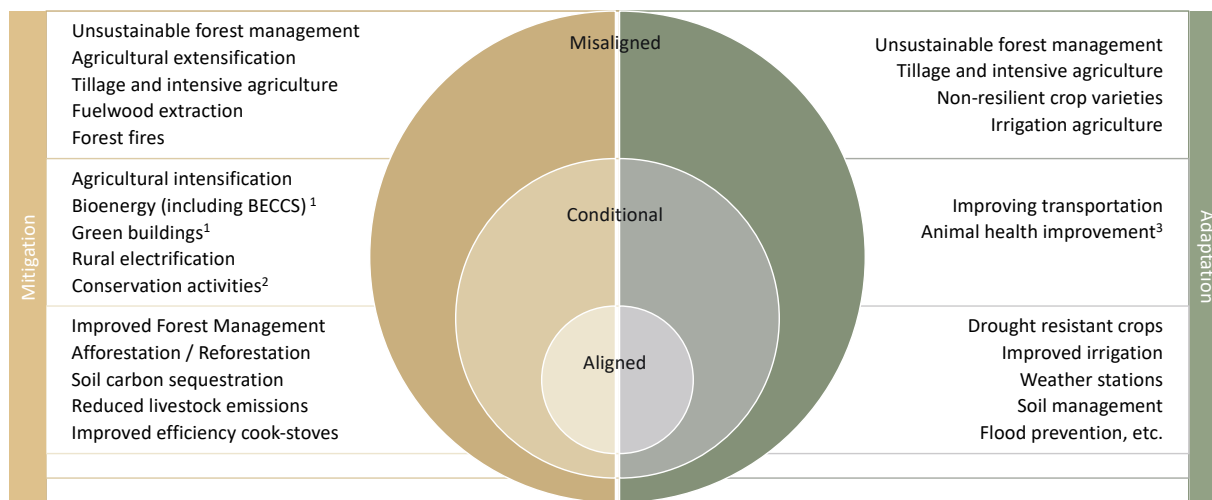
¹⁸ CCDA for example are separately developing a climate change adaptation GCF proposal

¹⁹ See e.g. Parker, C. and Watson, C., forthcoming. Opportunities to Unlock Finance for Climate-Smart Land Use; and Falconer, A., Parker, C., Keenlyside, P., Dontenville, A. and Wilkinson, J., 2015. Three tools to unlock finance for land-use mitigation and adaptation. *Amsterdam and Venice: Climate Focus and Climate Policy Initiative*.

²⁰ In a broader definition, this could also encompass increased resilience in land use ecosystems.

Climate-misaligned activities support sectors that are known drivers of deforestation and forest degradation. Examples of climate-misaligned land-use activities include agricultural intensification, unsustainable forest management, fuelwood extraction, and infrastructure development through forests (e.g. roads, transmission lines, and hydropower). These activities are commonly referred to as the drivers of deforestation and forest degradation and are typically identified during a county’s NRS development. Under a broader definition of land-use finance this could also include agricultural (i.e. on-farm) emissions, such as nitrogen and pesticide application, and activities that are not adapted to climate change impacts, or reduce the resilience of ecosystems.

Conditionally-aligned activities indirectly relate to land-use mitigation and adaptation outcomes, and have the potential to contribute both positively and negatively to climate-smart land use depending on the underlying national or regional conditions. Examples include agricultural intensification, bioenergy, and conservation activities. Agricultural intensification, for example, can contribute to climate change mitigation by increasing production on existing land, therefore reducing pressure on surrounding forests. If not coupled with strong land use policies, however, agricultural intensification can have unintended spillover effects that can lead to an increase in GHG emissions, e.g. by increasing the value of land and incentivizing more forests to be converted to agricultural lands. Other examples include road building, bioenergy, and rural electrification.



¹ Can reduce emissions in other sectors but depends on the sustainability of supply

² If not managed at a large scale these may result in leakage

³ Does not always have adaptation benefits

Figure 4 Potential scope of climate-relevant land use. The middle circle represents activities that are aligned with climate change mitigation and adaptation outcomes, outer circles represent activities that are either conditionally aligned, or misaligned with climate-smart land use outcomes. Taken from Parker, C. and Watson, C., forthcoming. Opportunities to Unlock Finance for Climate-Smart Land Use

The above set of activities all fall under the scope of **climate-relevant land-use**, i.e. these activities can impact land-use mitigation and adaptation outcomes either positively or negatively, and therefore fall within the scope of this analysis.

2.3 Definition of climate-relevant land use in Papua New Guinea

Given the above general definition, this section outlines the steps taken to develop a nationally-appropriate definition of climate-relevant land-use finance in PNG. In general the team conducted this analysis by first collecting information on all climate-relevant land-use sectors in PNG (i.e. agriculture and forestry) and then answering the following questions related to climate change mitigation outcomes (see Figure 5):

- Is the activity a known driver of deforestation or forest degradation or does the activity contribute to atmospheric CO2 removals?
- Does the activity improve upon business as usual practices?
- Is the activity aimed at improving the enabling environment, i.e. towards implementation of the NRS?

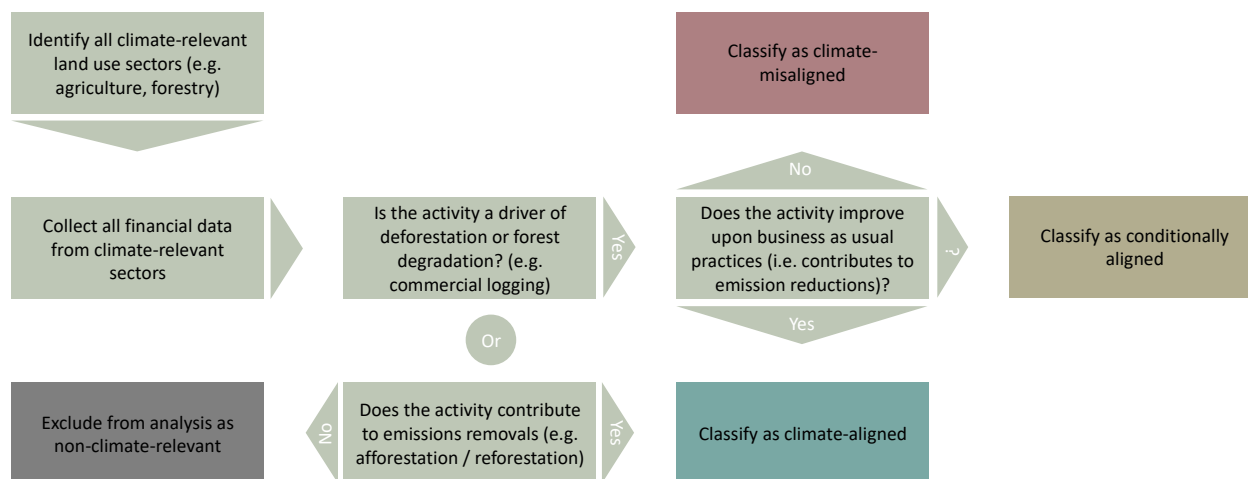


Figure 5 Process flow to determine climate-relevant land use flows in PNG, including classification as climate-aligned, conditionally aligned, or climate-misaligned.

Based on this process flow described above, the remainder of this section details the specific land-use activities that are classified as climate relevant in PNG.

2.3.1 Climate-misaligned land-use activities

Our working definition of climate-misaligned land-use activities in PNG is based on the existing drivers of deforestation and forest degradation. As outlined in Section 1 above, land use emissions in PNG are a result of three primary activities:

- Unsustainable commercial logging²¹;
- Subsistence (or garden) agriculture within forested areas²²; and
- Extensive commercial agriculture²³

This taxonomy is supported by other literature, even though the relative magnitude of other studies may vary.²⁴ These three activities are therefore considered as climate-misaligned land-use activities in PNG. Note that all three of these activities could be aligned with climate change outcomes if they were conducted in a sustainable manner. We have therefore qualified these activities to only refer to activities that have unsustainable impacts on deforestation and forest degradation.

2.3.2 Climate-aligned land use activities

PNG's National REDD+ Strategy identifies three action areas for REDD+ implementation, that could be considered to be aligned with climate change outcomes, namely:

- Strengthened land-use and development planning;
- Strengthened environmental management, protection and enforcement; and
- Enhanced economic productivity and sustainable livelihoods.

Under these categories, the strategy identifies a number of policies and measures, that can contribute to climate-aligned land use outcomes in PNG. In addition, several documents including the draft Green Climate Fund (GCF) concept note²⁵, the Issues and Options paper for REDD+ in PNG²⁶, and the National Strategy for Responsible Sustainable Development for PNG (StARS)²⁷, outline several activities that can support climate-aligned land use in PNG. The activities listed in these documents create an overall definition of climate-aligned land use in PNG:

- Plantation forestry including afforestation and reforestation²⁸;
- Sustainable forest management;
- Enabling conditions (e.g. policies, enforcement and capacity building);
- Conservation of forests; and
- Forest Monitoring Systems

²¹ Sustainable forest management, including reduced impact logging, is not considered to be an emission, if the rate of harvest is less than the rate of regrowth. Unsustainable logging in this context refers to harvesting above the rate of natural regeneration.

²² This activity in reality includes fires used to clear land for subsistence agriculture, and fuelwood collected as a result of land clearance

²³ Climate Change and Development Authority (2017) Papua New Guinea's National REDD+ Forest Reference Level. Submission for UNFCCC Technical Assessment in 2017 http://redd.unfccc.int/files/png_frl__submission-15.01.2017.pdf

²⁴ See e.g. Filer, C., Keenan, R.J., Allen, B.J. and Mcalpine, J.R., 2009. Deforestation and forest degradation in Papua New Guinea. *Annals of Forest Science*, 66(8), p.813.

²⁵ Still in formulation at the time of writing

²⁶ [http://www.pg.undp.org/content/dam/papua_new_guinea/FCPF/ROAR REports/2. Policy Brief_CAS and SIS_PNG.pdf](http://www.pg.undp.org/content/dam/papua_new_guinea/FCPF/ROAR%20Reports/2_Policy%20Brief_CAS%20and%20SIS_PNG.pdf)

²⁷ <http://www.planning.gov.pg/images/dnrm/pdf/StARS.pdf>

²⁸ This refers strictly to plantations established on non-forested areas.

2.3.3 Conditionally-aligned land use activities

Finally, as outlined above, certain activities may contribute to climate-change mitigation outcomes but only under certain conditions. These activities are indirectly related to forest emissions, e.g. creating increased demand for agricultural products, or subsidizing harvesting in remote rural areas. Activities that are classified as conditionally aligned are taken from international and national research and include:

- Demand-side measures that can increase agricultural production;
- Agricultural intensification that can increase the opportunity cost of land;
- Extension services that improve access to inputs, and skills (and increase production);
and
- Subsidies and other economic distortions that incentivize agricultural production

As noted above, these activities are not in themselves harmful, but - if not coupled with strong land titling, zoning and enforcement – can lead to conversion of forested land to other land use types.

2.3.4 Climate-relevant land use activities

Bringing these three components together gives us a fuller picture of climate-relevant land use in PNG (see Figure 6). In general, climate-relevant land use is related to two primary sectors, agriculture and forestry, with agriculture comprising both commercial and subsistence agriculture. Mining is not considered climate-relevant for this analysis since mining operations are relatively localized and have not been included as primary drivers of deforestation in the national forest reference level. Fuelwood is currently categorized as a driver within subsistence agricultural farming, since forest clearing for family gardens also typically provide fuel for cooking, and is an area for further analysis in terms of disaggregating these impacts from subsistence agriculture.

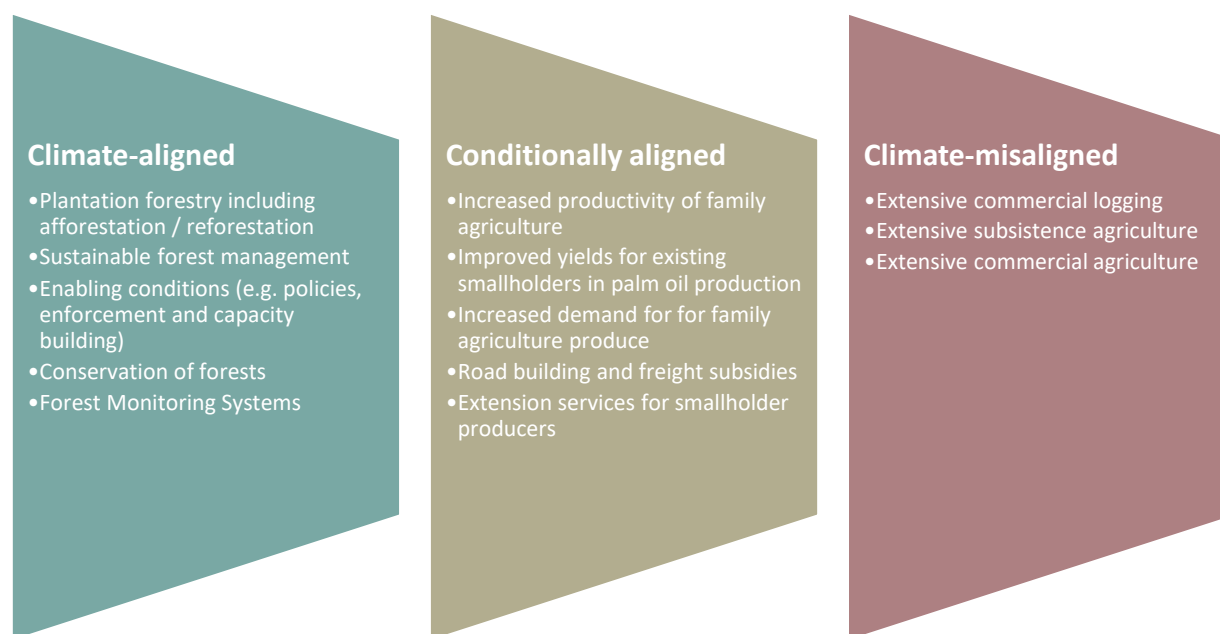


Figure 6 Classification of climate-relevant land-use finance in PNG

2.4 Data collection process

The landscape of land use finance in PNG includes financial flows related to domestic public finance, international donors, and trade-related flows from private sector activities where available. The data sources that were accessed to collect information on climate-relevant land use finance across these three major groups are listed in Table 2. In addition to these data sets, our team consulted relevant research and literature related to climate-relevant land use finance in PNG.

Table 1 Data sources for collection of climate-relevant land-use financial flows in PNG

Category	Data source
Domestic public finance	<ul style="list-style-type: none"> - 2017 National Budget: Volume 1, 2a, 2b, 2c and 2d - National legislation for data on financial instruments (for taxes and levies) - Bank of Papua New Guinea quarterly bulletins - Commodity Board financial accounts - District and Local Government offices - Inland Revenue Commission (for taxes, and tax credits)
International donor finance	<ul style="list-style-type: none"> - OECD DAC CRS - 2017 National Budget - Climate Funds Update - Voluntary REDD+ Database
Private sector finance	<ul style="list-style-type: none"> - UN Comtrade International Trade Statistics Database - National export records e.g. SGS Log Exports - Direct communications with private companies

Data collected for this study was screened and standardized based on the following criteria:

- Data for disbursements was collected (rather than commitments or pledges, which can often be delayed or change) in order to track actual flows.
- Where available, disaggregated project- and program-level financial data were collected in order to analyze individual activities and their alignment with climate-change objectives as well as to avoid double counting between different data sets.
- 2015 was chosen as the study year since it was the most recent year for which complete audited data was available for domestic and international public finance. The study covers a single year in order to establish a baseline of annual public land use expenditures that is as comprehensive and consistent as possible.
- Domestic recurrent government budgets related to personal emoluments (salaries and travel) and goods and services (travel and other operating costs) have been included in our final landscape but these expenditures are not classified according to our definition of climate-relevant laid out in Figure 6, due to the challenges in attributing these expenditures to any particular climate change outcome.
- Private sector finance includes revenues that are collected by central government²⁹, as well as revenues collected through levies and taxes imposed by statutory authorities from climate-relevant land use activities (discussed in Section 3).

2.5 Data analysis

In order to analyze financial flows, the datasets outlined above were first screened and classified in line with the definitions of climate-relevant land-use outlined in Section 2.3. The remainder of this section describes how financial data collected specifically for revenues and expenditures was analyzed according to these definitions.

2.5.1 Revenue analysis

The analysis of financial revenues relied upon data collected from a number of sources, including Bank of Papua New Guinea quarterly bulletins trade data, Annual financial reports (AFRs) for commodity boards, treasury data for central government revenues, and a recent report conducted by PNGFA for a number of forestry revenues. Since these data often do not correlate these sources were applied using the following hierarchy, i.e. data was taken from the first available source from this list:

1. Central government data
2. Annual financial reports (AFRs)
3. A combination of trade data and financial regulation

²⁹ Including non-revenues, e.g. through tax credits, and other tax breaks.

4. Other reports and data sources

Where available therefore our data reflects central government reports such as the national budget 2017, which contains audited financial information for 2015.

2.5.2 Expenditure analysis

This analysis uses data from the national budget, the OECD DAC CRS database, and to a lesser degree AFRs. In terms of an information hierarchy, internationally reported data is generally the most thorough and is considered first, followed by data reported in AFRs (where available), and national data reported through Public Investment Programs (PIPs). Since data sources often include limited descriptive information on the activities, the analysis relied heavily on supplementary information obtained from government documents such as Volume 3 of the National Budget, which describes Public Investment Programs for the years 2015 – 2019. Additional sources include academic research, donor and government websites, and in-depth consultations with national stakeholders.

2.6 Data interpretation

The main tool used for data interpretation in this paper are the Sankey diagrams presented in Figure 15 and Figure 17 of this paper. These infographics allow simple visualization of financial flows from different sources, through intermediaries and disbursement channels, and ultimately to different end uses. These diagrams rely heavily on work previously conducted by Climate Policy Initiative (CPI) on global landscapes of land use finance and a similar study to this one conducted in Côte d'Ivoire.³⁰

Additional data interpretation was conducted using Tableau, a product specializing in data visualization that also allows multiple diagrams and graphs to be created and viewed interactively.³¹

2.7 Methodological challenges

One of the major challenges of this study, and other studies like this, is the lack of transparency and access to financial data, at multiple levels. Perhaps the largest barrier in this regard was the lack of financial transparency of statutory authorities in disclosing financial information to both central government and their respective stakeholders. To address these shortcomings our team was able to collect Annual Financial Reports (AFR) for some of these organizations and corroborate and / or supplement this data with publicly available trade and economic data.

Other data-related challenges include the lack of disaggregated data on taxes and levies between the forestry and agricultural sectors. Ideally the government would share information

³⁰ Falconer, A., Dontenville, A., Parker, C. Daubrey, M. Gnaore, L., 2017. Landscape of REDD+ Aligned Finance in Côte d'Ivoire

³¹ Links to these visualizations will be available upon request.

related to taxes, infrastructure credits, and other fiscal instruments in a disaggregated way to allow for these individual sectors to be assessed. This is happening through the Extractive Industries Transparency Initiative (EITI) for the oil, gas, and mineral sectors, and could be extended to the forestry sector.

Finally, our decision to include recurrent budgets created a challenge in classifying these flows using the framework outlined in Figure 6. Ultimately, we have chosen to not classify these flows due to the challenge in attributing recurrent budget with climate-relevant land-use outcomes. Our analysis provides recommendations for how financial flows can be aligned towards climate-change outcomes, which applies at the program, or financial instrument level, but not at the departmental, or sectoral level. This approach was agreed upon through consultations, but is an area for further analysis and research.

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3 Contribution of land use to the economy in PNG

PNG is in a unique situation as a country with high forest cover, and relatively low rates of deforestation, while benefitting from strong economic growth in recent years, driven by a combination of resource extraction, and agricultural production for cash crops (primarily palm oil). This section reviews climate-relevant land-use sectors and their contribution to the overall economy of PNG and relevant fiscal processes for collecting finance from climate-relevant land-use sectors.

3.1 Contribution of climate-relevant land-use sectors to the economy

In 2014, PNG’s Gross Domestic Product (GDP) was estimated to be USD 20 billion (K56.6 billion³²), an increase of roughly 20% on the prior year due to the start of operation of PNG’s LNG project.³³ In general, PNG’s economy is largely supported by four sectors³⁴: agriculture, forestry and fishing (19%); mining (10%); extraction of crude oil and petroleum (12%); and wholesale retail and trade (11%), which combined contribute more than a half of GDP in PNG. In absolute terms, agriculture, forestry and fishing is the largest contributor to GDP and is also one of the largest sources of employment domestically, employing around 20% of the working population of PNG (see Figure 7).³⁵

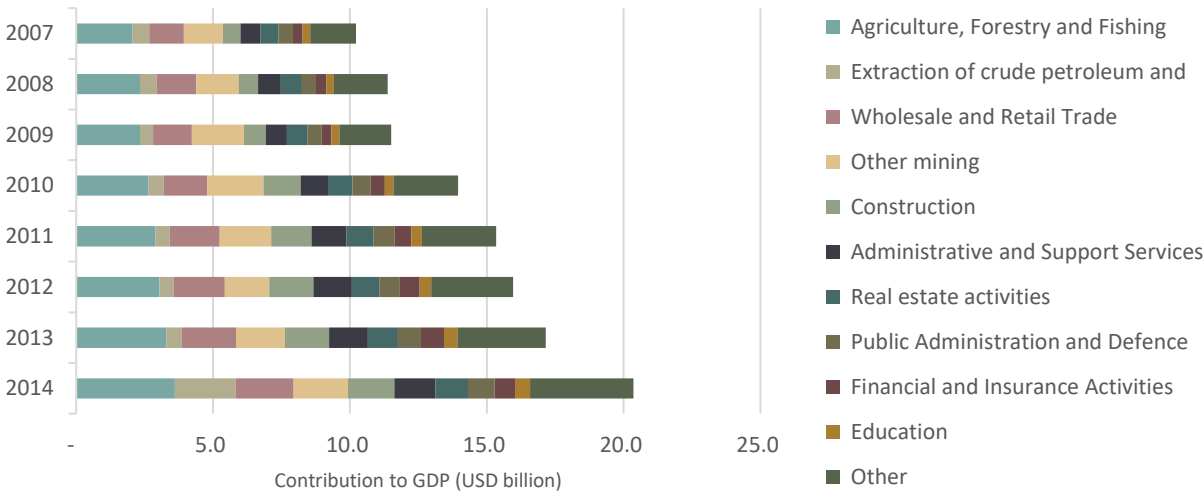


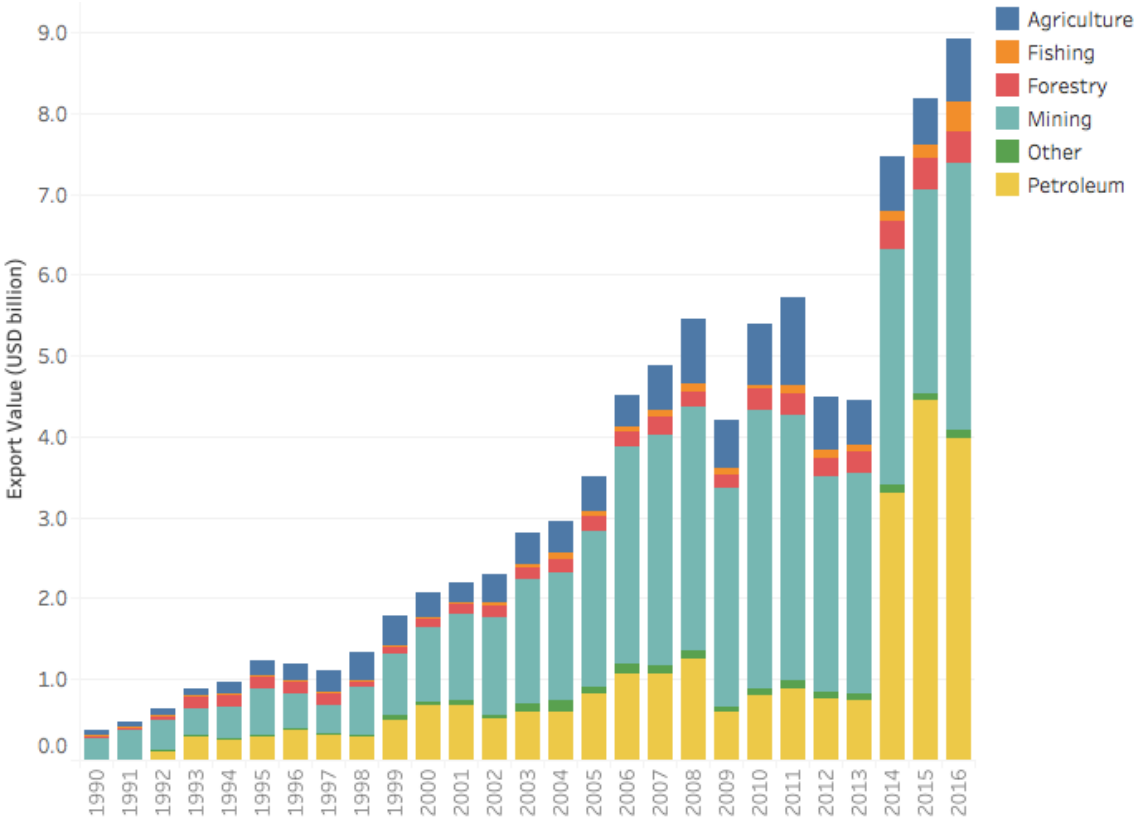
Figure 7 GDP of PNG by Sector from 2007 – 2014 (USD billion). Data on GDP at real prices from National Statistical Office (2015) Papua New Guinea National Accounts 2007 – 2014

³² An exchange rate of 0.36 Kina (K) per US dollar (USD) has been used throughout this document taken as the average exchange rate for the twelve reported months of 2015 by Bank of PNG. <https://www.bankpng.gov.pg/historical-exchange-rates/>
³³ While data is not available for GDP in real terms, this figure was calculated from data on GDP at real prices from National Statistical Office (2015) Papua New Guinea National Accounts 2007 – 2014
³⁴ As defined in NSO’s Papua New Guinea Standard Industrial Classification available from <https://www.nso.gov.pg/index.php/document-library?view=download&fileId=86>
³⁵ According to ILOSTAT data http://www.ilo.org/gateway/faces/home/statistics?_adf.ctrl-state=frhi5hayi_4&locale=EN&countryCode=PNG. Although World Bank indicators place this figure a lot higher at 70%. <https://data.worldbank.org/indicator/SL.AGR.EMPL.ZS?locations=PG>

While more difficult to quantify, agriculture and forestry also contribute significantly to the informal economy. A 2006 study of livelihoods in PNG estimated informal incomes from subsistence farming to be around K250 per family of seven per week³⁶, which could have an economic equivalent of up to USD 3.6 billion (K10 billion)³⁷, or around the same size as the formal agricultural, forestry and fishing sectors' contribution to the economy combined.

3.1.1 Land use and exports in Papua New Guinea

Historically, agriculture and forestry have been a large part of PNG's export revenues, but with the advent of mining, and oil and gas extraction, the relative share of these exports is far smaller today. Agriculture and forestry, which were once more than a quarter of all export revenues, averaged around a sixth of total exports between 2010 and 2015, equivalent to USD 1 billion per year (K2.8 billion) (see Figure 8).³⁸ Both agricultural and forestry exports have remained relatively stable over this period at USD 700 million (K2 billion) or 11.7% of total exports, while forestry exports averaged USD 300 million (K800 million) or 4.9% of total exports over the same period.



³⁶ Anderson, T., 2006. On the economic value of customary land in Papua New Guinea. *Pacific Economic Bulletin*, 21(1), pp.138-152.

³⁷ This simplification assumes 70% of PNG's population have a 1 ha plot of land per family for subsistence farming, which is broadly in line with the 3 million ha of land used for garden agriculture.

³⁸ Data from Bank of Papua New Guinea Quarterly Economic Bulletin Statistical Tables 8.2, 8.3, 8.4 and 8.5. Available <https://www.bankpng.gov.pg/statistics/quarterly-economic-bulletin-statistical-tables/>

Figure 8 Value of all major commodities exports by type and year in USD billions. Data from Bank of Papua New Guinea Quarterly Economic Bulletin Statistical Tables 8.2, 8.3, 8.3 and 8.5. Available <https://www.bankpng.gov.pg/statistics/quarterly-economic-bulletin-statistical-tables/>

The combined share of these sectors over time has steadily declined, largely as a result of the increased revenues from mining and petroleum. In 2016, for example, revenues from extractive industries, for the first time in PNG’s history, accounted for more than 80% of all export revenues. This is in large part due to the new PNG LNG project, which came online in May 2014, and alone contributed USD 3 billion (K8 billion) in export revenues in 2015 through the export of liquefied natural gas. The US\$19 billion PNG liquid natural gas (LNG) project is an integrated development program that is commercializing the oil and gas resources of Papua New Guinea in Hela, the Southern Highlands, and the Western and Gulf provinces.³⁹

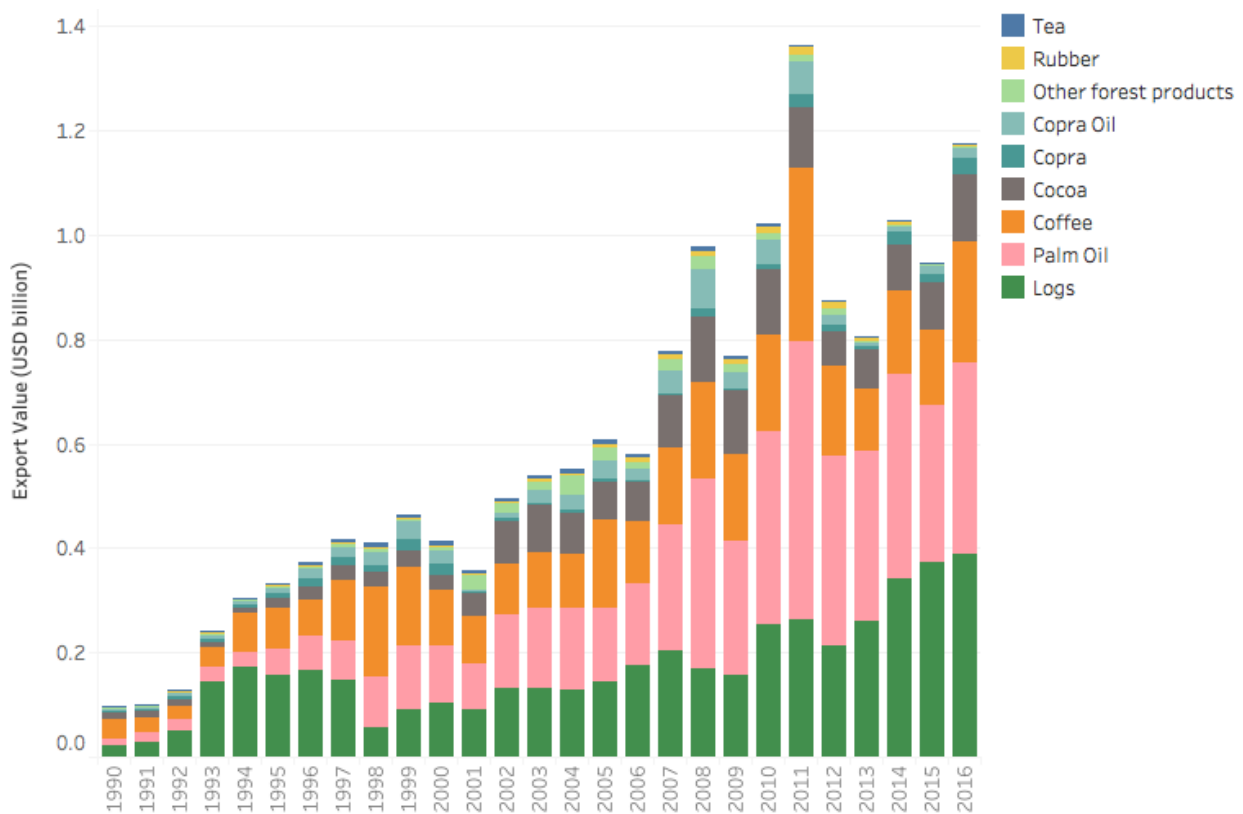


Figure 9 Value of all agricultural and forestry exports by year in USD billions. Data from Bank of Papua New Guinea Quarterly Economic Bulletin Statistical Table 8.3. Available <https://www.bankpng.gov.pg/statistics/quarterly-economic-bulletin-statistical-tables>

Total climate-relevant land use exports therefore amounted to USD 1 billion per year (K2.8 billion), equivalent to 16.5% of total exports between 2010 and 2015 (see Figure 8).⁴⁰ In the

³⁹ <https://pnglng.com/About/Project-overview>

⁴⁰ Data from Bank of Papua New Guinea Quarterly Economic Bulletin Statistical Tables 8.2, 8.3, 8.4 and 8.5. Available <https://www.bankpng.gov.pg/statistics/quarterly-economic-bulletin-statistical-tables/>

agriculture and forestry sectors, the two major exports are (unprocessed) round logs, which generated revenues of USD 374 million (K1 billion) in 2015,⁴¹ and palm oil, which averaged USD 360 million (K1 billion) per year in export revenues between 2010 and 2015. Coffee (USD 180 million), and cocoa (USD 86 million) are the next major exports, and collectively these four commodities comprise 94% of all agricultural and forestry exports in PNG (see Figure 9).⁴²

3.2 Climate-relevant land-use revenues

PNG has a number of financial instruments to capture revenues from agricultural and forestry activities. These revenues can generally be grouped into sector specific financial instruments, such as the log export tax, and central government financial instruments, such as customs and excise, or infrastructure tax credits. Recipients can also be grouped into four groups, namely: i) central government departments, such as the Internal Revenue Commission (IRC) and Bureau of Customs; ii) sector specific statutory authorities, such as Papua New Guinea Forest Authority (PNGFA) or Oil Palm Industry Corporation (OPIC) that are created by acts of parliament but operate independently of government; iii) provincial governments and local authorities that collect provincial and local taxes and levies; and iv) landholders who can receive revenues from land rental and royalties. The various revenues collected from climate-relevant land-use activities in PNG are listed in Figure 10 below, and the remainder of this section describes these revenue collection mechanisms across these four major groups.

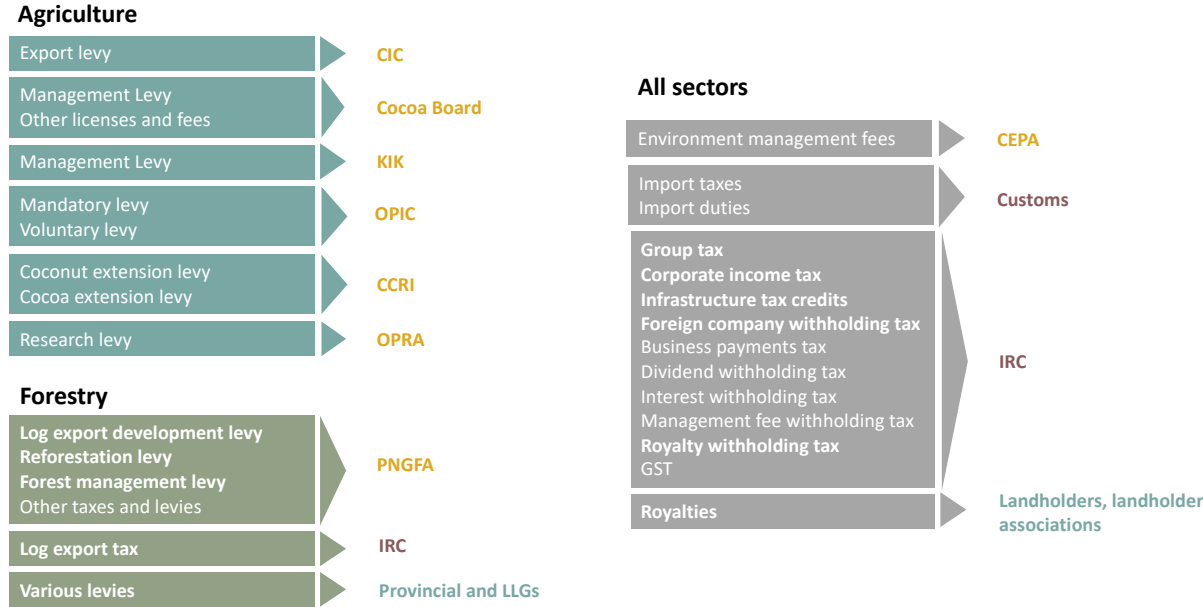


Figure 10 Climate-relevant land-use financial instruments in PNG grouped by sector. Instruments in bold are materially more significant. Recipients are grouped by color: yellow are statutory authorities, mauve are central government, and blue are

⁴¹ Total FOB Values from SGS 2015 Log Export Monitoring Monthly Report
⁴² Data from Bank of Papua New Guinea Quarterly Economic Bulletin Statistical Table 8.3. Available <https://www.bankpng.gov.pg/statistics/quarterly-economic-bulletin-statistical-tables/>

3.2.1 Central government revenue

The government collects general revenue through three primary departments: Bureau of Customs, which deals with **excise tax** on specific products including tobacco, alcohol and petroleum, as well as **taxes on international trade**; the IRC, which collects **income tax**, **company taxes**, and other **domestic taxes**, such as Goods and Services Tax (GST); and Department of Treasury, which collects **dividends** and other state interests from projects such as the PNG LNG project joint ownership. General revenue in 2015 totaled USD 3.2 billion (K8.8 billion), representing 15.6% of GDP, and was primarily collected through taxes by IRC (see Figure 11 below).⁴³

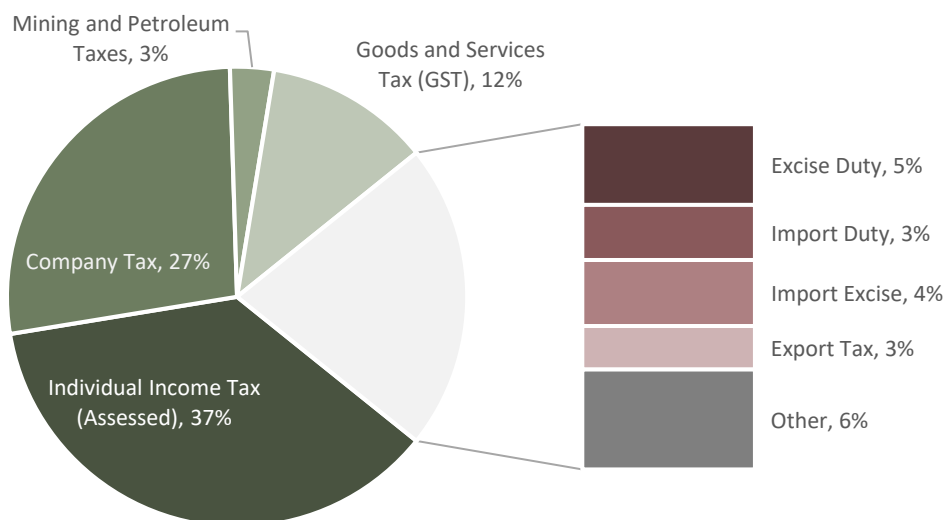


Figure 11 Sources of revenue to the government of PNG showing revenues collected by IRC in green, Bureau of Customs in Red, and other revenues in Grey. Total revenues USD 3.2 billion (K8.8 billion). Department of Treasury, 2017. Vol 2a Section (II) Details of Revenue, Grants and Loan Estimates http://www.treasury.gov.pg/html/national_budget/2017.html.

The relative contribution of climate-relevant land-use sectors (i.e. forestry and agriculture) to central government is hard to estimate, given the lack of transparency of company profits and individual income for these sectors. Overall, we estimate total revenues to central government to be USD 460 million (K1.3 million) or 14.5% of total government revenues (see Figure 12).⁴⁴

IRC collects the majority of revenues through **tax revenues**, which have been estimated using the agriculture and forestry sectors' contribution to GDP. Based on a 12% share of GDP for agriculture, we estimate that IRC collects tax revenues of USD 280 million (K0.8 billion) for this

⁴³ For the purpose of this analysis 2017 budget data was used, which contains actual revenues and expenditures for 2015, our year of study. See Department of Treasury, 2017. Vol 2a Section (II) Details of Revenue, Grants and Loan Estimates http://www.treasury.gov.pg/html/national_budget/2017.html.

⁴⁴ See Annex I for a full list of climate-relevant land-use revenues

sector. Forestry contributions are harder to estimate, given the relatively low profits (and losses) associated with forestry companies.⁴⁵ For the purpose of this analysis, we have assumed 5% of GST and personal income tax are related to forestry (based on the sector’s contribution to GDP), and company income tax is estimated to be zero, and is an area for further research.

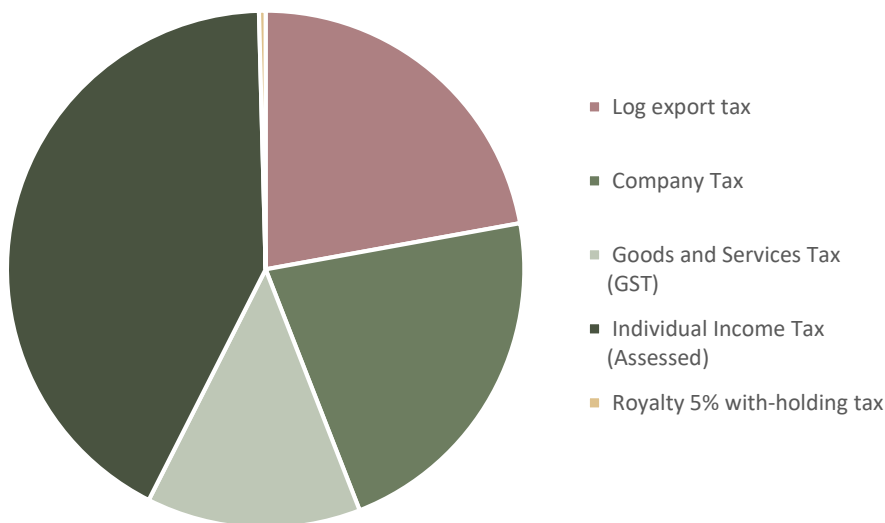


Figure 12 Sources of revenue to the government of PNG from agriculture and forestry showing revenues collected by IRC in green, and Bureau of Customs in red (there are no quantified revenues to Department of Treasury). Total revenues USD 460 million (K1.3 million) or 14.5% of total government revenues. Authors calculations based on multiple sources.

Other central government revenues that are directly related to climate-relevant land-use sectors include the **log export tax**, which is generated from a fixed tax of 28.5% on unprocessed old-growth logs and paid to the Bureau of Customs, and a **5% Royalty withholding tax**, payable to IRC as a percentage of royalty payments to landholders. The log export tax alone generated USD 100 million (K282 million) in 2015, equivalent to 3% of government revenues.⁴⁶

Given the small contribution of forestry to overall exports, this tax constitutes a high burden on the forestry industry compared to other sectors. Mining and agriculture, for example, do not face similar taxation rules for their export of commodities. While this high rate of taxation has historically been justified to promote domestic timber processing to create jobs, the policy is clearly not having that effect. Between 1990 and 2016, the value of exported processed forest products has remained relatively static at around USD 3-10 million (K10-30 million) per year, while whole log exports have increased by over 1500% during the same period (from USD 20 million to USD 360 million) (see Figure 13). Further recommendations to increase this tax, as

⁴⁵ PriceWaterhouseCoopers,, 2006. Economic Analysis and Potential of PNG Forestry Industry

⁴⁶ This figure is taken from Department of Treasury, 2017. Vol 2a Section (II) Details of Revenue, Grants and Loan Estimates. http://www.treasury.gov.pg/html/national_budget/2017.html, but does not correspond with the figures presented in SGS’ annual report on levies payable, which totaled K282 million (11% less than reported to Treasury).

proposed under the recent 2017 budget⁴⁷ are unlikely to have the desired effect, and a more systematic review of forest policy is needed to achieve the policy outcomes intended by the log export tax. In Section 5, we provide recommendations for reforming the log export tax, to encourage more sustainable forest management in PNG.

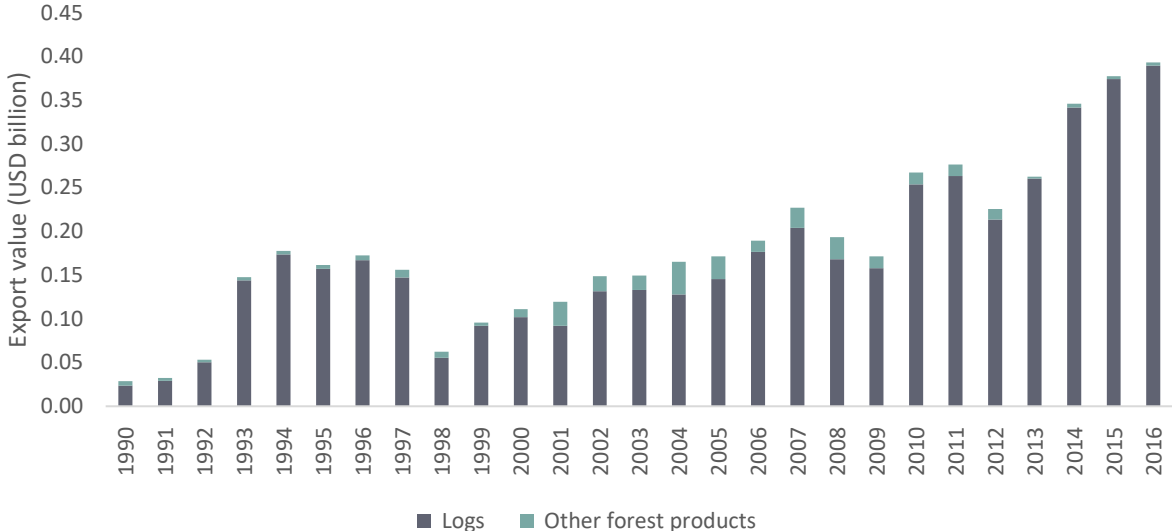


Figure 13 Export value of (unprocessed) logs versus other (processed) forest products in PNG from 1990 – 2016 (USD billion)

Royalty and dividend withholding taxes are similarly treated differently across sectors: the mining sector applies taxes of 10% for dividends paid by companies carrying out mining operations, and the dividend withholding tax rate is zero for dividends paid out of petroleum or gas income. Likewise, interest withholding tax rate on interest paid by resource companies on funds borrowed directly from a non-resident lender is nil.⁴⁸

While difficult to quantify, our analysis also looked into a number of other financial instruments administered by IRC including **infrastructure tax credits (ITC)**, and **tax exemptions for rural development industries**, that apply in various ways to climate-relevant land use sectors.⁴⁹ Since ITCs are both a revenue and an expenditure to government they are not classified in our main flows, but we provide an analysis of these revenues here for completeness.⁵⁰ In 2015, tax incentives under the Income Tax Act resulted in a combined transfer of revenue of USD 100

⁴⁷ Department of Treasury, 2017. Vol 1 Section 5.2.2 Increase benefits from exports of unprocessed old-growth logs through Progressive Export Duty Rate suggests that this tax should be increased with a progressive taxation system to “encourage downstream processing, capture resource rent from high valued species of old-growth logs and simplify administration” http://www.treasury.gov.pg/html/national_budget/2017.html.

⁴⁸ Papua New Guinea Extractive Industries Transparency Initiative (PNG EITI) 2015. Report for 2015 21 December 2017

⁴⁹ Taxation Review Committee, 2014. Papua New Guinea Taxation Review (2013-2015) Issues Paper No.5: An examination of the advantages and disadvantages of tax incentives

⁵⁰ These flows are considered a revenue for government since they are not investing in infrastructure projects, equally they are classified as an expenditure because government are not receiving a portion of income tax. The same logic can be applied to the private company in reverse.

million (280 million Kina).⁵¹ According to IRC, total ITCs claimed in 2015 amounted to USD 80 million (K217 million). Given the lack of transparency in reporting, it is not possible to confirm a precise amount that is allocated to ITCs, but assuming, conservatively that 25% percent of these revenues are related to agricultural companies (forestry companies cannot make use of tax credits), this would result in climate relevant ITCs of 20 million in 2015. More research is needed on tax incentives in general, including increased transparency in the application of tax credits, as will be discussed further in the next section.

In addition to general revenues, individual government departments can also collect revenue directly. Only the land lease rental, collected by the Department of Lands & Physical Planning, is related to climate-relevant land use, which totaled less than USD 200,000 (K449,400) in 2015, and is therefore not considered material for this analysis.⁵²

3.2.2 Statutory authority revenues

PNG has a number of statutory authorities that collect and disburse finance from climate-relevant land-use activities that either operate under a specific commodity (e.g. the PNG Forest Authority for forestry) or for a specific function (e.g. the Conservation and Environment Protection Authority related to environmental monitoring and enforcement). The recent Public Money Management Regularisation Act places considerable uncertainty over the future of statutory authorities, since as of March 2018, all funds managed under trust accounts held by statutory authorities have been transferred to a Consolidated Revenue Fund within Department of Treasury.⁵³

While financial information is generally lacking on statutory authority revenues, the information presented here is collected from Annual Financial Reports (AFRs) where available, supplemented by secondary resources, and proxy estimates such as international and domestic trade data.⁵⁴ The remainder of this section details the role of individual statutory authorities and the individual levies that they can collect.

In total, revenues to statutory authorities totaled USD 66 million (K184 million) in 2015. The majority (86%) of these revenues are collected by PNGFA centrally (29%) or on behalf of Provincial Forest Management Committees (57%). PNGFA also has the largest number of levies, with PFMCs collecting 11 levies, and PNGFA collecting three levies. The next largest statutory

⁵¹ See Department of Treasury, 2017. Vol 2a Section (I) Table 1.2. http://www.treasury.gov.pg/html/national_budget/2017.html.

⁵² Materiality is defined as contributing to more than 2% of total revenues or expenditures.

⁵³ Public Money Management Regularisation Act 2017. PAR II Regularisation of public money

⁵⁴ According to domestic fiscal policy, these organizations should report directly to their managing department, but this is not common practice, and there is relatively little transparency and detail of revenues and expenditures for statutory authorities. See e.g. Bank of Papua New Guinea QEB Statistical Tables 5.1 and 5.2 COMMODITY INDUSTRY BOARDS AND STABILISATION FUNDS which have no record of deposits and investments for major commodities <https://www.bankpng.gov.pg/statistics/quarterly-economic-bulletin-statistical-tables/>

authority by revenues is the Oil Palm Industry Corporation (OPIC) which collects USD 3 million (K9 million) or 5% of total revenues (see Figure 14).

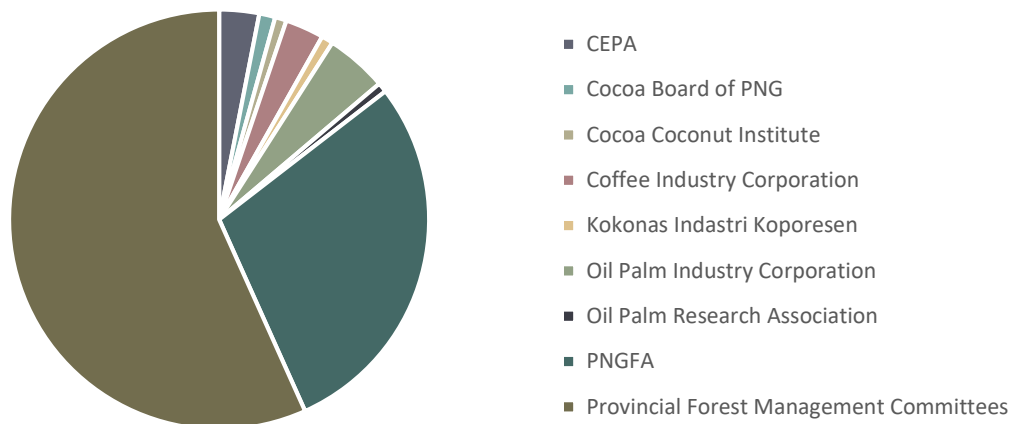


Figure 14 Revenues collected by statutory authorities in 2015. Total USD 66 million (K184 million). Authors cacluations based on data from individual statutory authority annual financial reports (AFRs)

3.2.2.1 Forestry

The forestry sector in PNG is governed by the Forest Authority (PNGFA), which was established in 1993 as an independent body to oversee and sustainably manage the forests of PNG. The Authority consists of a National Forest Board, which provides oversight and management, the National Forest Service, which acts as the implementing arm of PNGFA, and Provincial Forest Management Committees (PFMCs) in each province to enable consultation with provincial governments and customary landowners.⁵⁵ PNGFA receives revenues directly under budget allocation, but is expected to support itself through the collection of fees and taxes on timber producers, and has several financial instruments that it oversees directly. The most important of these is the **log export development levy**, which is collected and transferred by the IRC at the rate of K8/m³ of total logs exported⁵⁶ to finance basic infrastructure projects, such as roads, health care facilities and water supply systems in communities where they operate.⁵⁷ The collection of the levy is closely monitored by SGS who report on monthly log exports, Free On Board (FOB) value, and levy payable.⁵⁸ In 2015, based on total log exports of 3.87 million m³, the log export development levy generated USD 11 million (K31.0 million) in revenues for PNGFA. This money is held in a trust account under the Ministry of Finance, and use of funds will be discussed further in the next section.

⁵⁵ Bird, N., Wells, A., van Helden, F. and Turia, R., 2007. The current legal and institutional framework of the forest sector in Papua New Guinea. *Overseas Development Institute, London.* and

⁵⁶ Except on the export of plantation logs, see Forestry Act 2007 and

⁵⁷ Hamago, L., Ezebilo, E., 2017. The Log Export Development Levy in Papua New Guinea: Are We Using it to Develop Infrastructure?

⁵⁸ SGS is a Swiss inspection, verification, testing and certification company with operations in 145 countries around the world. <http://www.sgs.com>

Other revenues collected centrally by PNGFA include the **Reforestation Levy**, and **Forest Management Levy**. These levies are generally quite opaque, and very little data exists, either within the national budget or within PNGFA of the scale of these levies. The Reforestation Levy, for example, varies from project to project between K0.50/m³ and K2.00/m³ log harvest.⁵⁹ A recent report prepared in part by PNGFA estimated the Reforestation Levy and Forest Management Levy to be USD 5 million (K14.1 million and USD 3 million (K9.4 million) respectively in 2015. This is calculated as 1.5% and 1% of non-plantation revenues, excluding a 5% withholding tax.⁶⁰

In addition to its central revenues, described above, PNGFA also collects and manages revenues indirectly through **Provincial Forest Management Committees (PFMCs)**. These revenues are collected through a number of mechanisms, which are financially opaque, and lack clear regulatory guidance. The levies include an **Agriculture Levy, Infrastructure Development Levy, Business Development Levy, Shelter Levy, Education & Training Levy, Spiritual Development Levy, Project Development Benefit, and Future Generation Levy**. In addition to a lack of transparency in the collection of these revenues, the funds - once collected - are also not transparently disbursed, which will be discussed in the following chapter. In total, these various levies amounted to USD 30 million (K104 million) in revenues for PFMCs in 2015.

3.2.2.2 Agricultural commodities

Agricultural commodities similarly have statutory authorities that collect revenues from (and provide extension services to) producers across the major export commodities in PNG. In general, these revenues however, are far smaller than those in the forestry sector despite larger overall export revenues from the agricultural sector. The main “commodity boards” in PNG are the Cocoa Coconut Institute (CCI), the Coffee Industry Corporation (CIC), the Cocoa Board of PNG (CBPNG), the Coconut Industry Corporation (Kokonasi Industri Koporesen; KIK), and the OPIC.

These statutory bodies also lack financial transparency, and do not declare their revenues directly through the national budget process, even though they are mandated to do so. The revenues presented here are a combination of proxy data collected from international trade statistics, and regulations governing these statutory bodies that outline how they should collect revenue. In some cases, this data has been cross referenced with individual commodity board financial accounts gathered during our research process.

The following table presents the results of this analysis showing the unit levy amount, and total revenues collected by these commodity boards, and any deviation in reported figures and

⁵⁹ PNGFA, 2004. Towards Sustainable Timber Production – A Review of Existing Logging Projects. Prepared By: the 2003/2004 Review Team

⁶⁰ Authors calculation although no basis for this assumption was ever substantiated.

estimates of these revenues based on reported trade data. The remainder of this section presents these commodity boards in more detail.

Table 2 Calculated and reported revenues from commodity boards through their associated levies. In all cases, where available, self-reported revenues have been used in the financial analysis of this report. Trade volumes are from Bank of PNG Quarterly Economic Bulletins and reported revenues are from organizational Annual Financial Reports.

Organization	Commodity	Levy (K/tonne)	Trade Volume (tonnes)	Calculated revenues (Kina million)	Reported revenues (Kina million)	Deviation
KIK	Copra, Copra Oil	30/40 ⁶¹	48,172	1.59	1.66 ⁶²	4%
CBPNG	Cocoa	25	30,900	0.77	0.84	8%
CCRI	Cocoa	15	30,900	0.46	0.35	-32%
CCRI	Copra, Copra Oil	4	48,172	0.19	0.37	48%
CIC	Coffee	100	42,800	4.28	4.17	-3%
OPIC	Oil Palm	4 ⁶³	486,933	7.79 ⁶⁴	8.70	10%
OPRA	Oil Palm	0.5/0.8 ⁶⁵	486,933	0.34	N/A	-

The **Kokonas Industri Koporesen (KIK)** was established in 2002 to replace the Copra Marketing Board and deregulate the marketing of copra (dried coconut kernels, from which oil is obtained) and all other coconut products. KIK collects a **management levy** on copra, copra oil and coconut meal, at a rate of K34/tonne, K44/tonne, and K10 per tonne respectively.⁶⁶ Of these levies, K4/tonne are collected by the Cocoa Coconut Research Institute for its research activities. BPNG reported total copra export income of USD 30 million (K84.2 million) (USD 16 million from copra and USD 14 million from copra oil), based on export of 33,600 tonnes of copra and 14,600 tonnes copra oil, respectively. This corresponds to revenues of USD 0.5 million (K1.59 million) from the management levy, which corresponds (with 8% deviation) to KIK reported revenues of K1.66 million in its Annual Financial Report (AFR) (see Table 2).

The **Cocoa Board of PNG (CBPNG)** is responsible for the inspection of all export cocoa and is funded by a K40/tonne **management levy** on exported cocoa. Of this levy, K25/tonne resides with CBPNG for its operations, and K15/tonne goes to support the Cocoa Coconut Research Institute for its research activities. Based on reported exports of 30,900 tonnes cocoa in 2015,

⁶¹ K30 for Copra K40 for Copra Oil

⁶² KIK only reported combined revenues and the deviation is based on the combined estimated total

⁶³ We assume that there is no payment of the K4 voluntary from millers and calculate total revenues based on the K4 mandatory levy from smallholders. This is discussed further under the section on OPIC.

⁶⁴ We assume that 1 tonne of crude palm oil is extracted from 4 tonnes of fresh fruit bunch. See KPMG, 2014. FFB Price Formula Review

⁶⁵ K0.5 for smallholder and K0.8 for estates

⁶⁶ Allen, Bryant. "Agricultural Development, Policies and Governance." In *Food and Agriculture in Papua New Guinea*, edited by Bourke R. Michael and Harwood Tracy, 425-88. ANU Press, 2009. <http://www.jstor.org/stable/j.ctt24h987.18>.

estimated revenues for CBPNG in 2015 are USD 0.3 million (K0.77 million), which corresponds closely to CBPNG reported revenues of K0.84 million in its AFR. In addition to its management levy, CBPNG also collects revenues from fees including export licenses, and dealer licenses that totaled K1.4 million in 2015. These revenues have been included in this analysis alongside other levies.

The **Cocoa Coconut Research Institute (CCRI)** is a research and extension organization that collects revenues from producers through a share of the levies collected by Cocobod, and KIK. The levy on cocoa producers is K15/tonne,⁶⁷ and copra and copra oil producers pass through K4/tonne of their levies to KIK.⁶⁸ Based on exports of 30,900 tonnes of cocoa, and 48,200 tonnes of copra oil, estimated revenues from these levies in 2015 are K0.66 million (K0.46 from cocoa and K0.19 from coconut products). While the total revenue is approximately aligned with revenues reported in the AFR, individual revenues vary significantly. In its AFR CCRI identifies revenues of USD 0.1 million (K0.35 million) from cocoa, and USD 0.1 million (K0.37 million from copra proceeds, which are 32% less than and 48% more than estimated revenues respectively. It is unclear if this is due to a discrepancy in reported and actual levies, or an accounting error.

The **Coffee Industry Corporation (CIC)** has a broad range of functions, including buying and selling coffee, setting prices, registering and controlling exports, setting standards and managing market participants.⁶⁹ The CIC has an **export levy** of K100/tonne, which it collects for operations and regulation. Based on reported exports of 42,800 tonnes of coffee in 2015, estimated revenues for CIC in 2015 are K4.3 million, which corresponds closely to CIC reported revenues of Kina 4.17 million in its AFR. CIC also collects fees from registration and sales of coffee beans and seedlings that totaled K0.31 million and K0.98 million respectively.

The oil palm industry has two bodies that operate with producers. The first is the **Oil Palm Industry Corporation (OPIC)**, which is a statutory authority similar to other commodity boards in PNG. OPIC was established in 1992, as part of a reform of the oil palm industry in response to low oil palm prices and poor government extension services.⁷⁰ From 1992 – 1997 OPIC was fully government funded, but since 1997 OPIC additionally collects a levy of K4/tonne of fresh fruit bunch (FFB) from producers and a voluntary contribution of K4/tonne from millers.⁷¹ OPIC

⁶⁷ Omuru, E. and Kingwell, R., 2006. Funding and managing agricultural research in a developing country: a Papua New Guinea case study. *International Journal of Social Economics*, 33(4), pp.316-330.

⁶⁸ This levies were shown to be higher in Allen, Bryant. "Agricultural Development, Policies and Governance." In *Food and Agriculture in Papua New Guinea*, edited by Bourke R. Michael and Harwood Tracy, 425-88. ANU Press, 2009. <http://www.jstor.org/stable/j.ctt24h987.18>. The figures here are the more recent report Department of Agriculture and Livestock, 2014. *Towards Agriculture Transformation and a New Direction for Enhancing Productivity in Agriculture Functional and Expenditure Review of Agricultural Commodity Boards and Agencies*

⁶⁹ *Food and Agriculture in Papua New Guinea*, edited by Bourke R. Michael and Harwood Tracy, 425-88. ANU Press, 2009. <http://www.jstor.org/stable/j.ctt24h987.18>.

⁷⁰ Ibid.

⁷¹ Department of Agriculture and Livestock, 2014. *Towards Agriculture Transformation and a New Direction for Enhancing Productivity in Agriculture Functional and Expenditure Review of Agricultural Commodity Boards and Agencies*

declared revenues of USD 3 million (K8.7 million) in 2015 in their ARFR. This compares closely (10% deviation) to estimated levies based on production volumes of 486,933 tonnes of crude palm oil (CPO) in 2015 and an extraction rate of 0.25 tonnes of CPO per fresh fruit bunch (FFB).⁷² These figures also confirm that OPIC only collects the mandatory levy from smallholders and not the additional 4K per tonne from millers.⁷³

The second oil palm industry body is the **Oil Palm Research Association (OPRA)**, a non-profit research organization established in 1980⁷⁴ by three of the largest palm oil producers in PNG.⁷⁵ OPRA also provides research, development and technical support and is funded by a K0.5/tonne FFB levy on production for smallholders and K0.8/tonne levy for plantations.⁷⁶ Assuming 65% of oil palm is produced by estates, and 35% is produced by smallholders⁷⁷, we estimate that OPRA generated revenues of USD 0.5 million (K1.35 million) in 2015. We were unable to verify these figures since OPRA did not provide an AFR.

Several other statutory authorities operate within PNG in climate-relevant land use commodities, notably the Fresh Produce Development Agency, the National Agricultural Research Institute, the National Agriculture Quarantine & Inspection Authority, the Rubber Industry Board and the Spice Board. These organizations have not been included in this financial analysis because they are either not material⁷⁸, their impact on land use is small, or they do not collect finance directly from producers or exporters.

3.2.2.3 Other statutory authorities

Finally, although not related to any particular commodity, the **Conservation and Environment Protection Authority (CEPA)** can collect fees and bonds through its Environmental Act 2000, and the various amendments and regulations that accompany this act. Forestry companies paid a total of USD 1.7 million (K4.7 million) through **environmental management fees** in 2015.⁷⁹ Based on production areas for cash crops, we assume that environmental fees from commercial agriculture are around K1 million in 2015.⁸⁰

⁷² The 0.25% extraction rate is taken from KPMG, 2014. FFB Price Formula Review

⁷³ Although in reality the voluntary levy is withheld due to ineffective governance of OPIC, for our analysis we assume that it is paid in full. See e.g. Department of Agriculture and Livestock, 2014. Towards Agriculture Transformation and a New Direction for Enhancing Productivity in Agriculture Functional and Expenditure Review of Agricultural Commodity Boards and Agencies

⁷⁴ Mbabu, A.N. and Hall, A. eds., 2012. *Capacity building for agricultural research for development: lessons from practice in Papua New Guinea*. LINK Ltd.

⁷⁵ Higaturu Oil Palms Ltd, New Britain Palm Oil Ltd and Hargy Oil Palms Ltd from *ibid*.

⁷⁶ Stated in *Food and Agriculture in Papua New Guinea*, edited by Bourke R. Michael and Harwood Tracy, 425-88. ANU Press, 2009.

<http://www.jstor.org/stable/j.ctt24h987.18> although other sources provide different levies, this figure has been used here for consistency

⁷⁷ Department of Agriculture and Livestock, 2014. Towards Agriculture Transformation and a New Direction for Enhancing Productivity in Agriculture Functional and Expenditure Review of Agricultural Commodity Boards and Agencies

⁷⁸ For this analysis we define materiality as 1% or more of total revenues.

⁷⁹ Borde, A., and Turia, R., 2016. Financial Flow of Land Use Sectors in Papua New Guinea

⁸⁰ Based on cash crops using 20% of the area of land used for logging from the national forest reference level

3.2.3 Landholders and landholder associations

The third set of entities that can collect revenues directly from climate-relevant land use activities are landholders, and landholder associations. Under PNG's land tenure system, customary landholders have legal control of land, and also receive revenues from harvesting and sale of timber. Customary lands are registered under an Incorporated Land Group (ILG), which is a legal mechanism that allows customary groups to hold, dispose, manage and deal with land in their customary name.⁸¹

The primary function of ILGs in the forestry sector is to channel **royalties** paid from timber concessions to individual landholders. ILGs do not collect revenues directly; these are collected by PNGFA, and held in PNGFA accounts on behalf of landowner groups. Longstanding concerns exist related to the transparency, prior consent, and splintering of ILGs as a result of large payments⁸², but these groups are still the *de facto* entity for engaging with landholders in both the forestry and agriculture sectors, and other extractive industries. According to a recent analysis conducted by PNGFA, royalties allocated to ILGs totaled USD 36 million (K100.55 million) in 2015, equivalent to around 10% of total export value.⁸³ ILGs can also collect revenues through a management levy, which are estimated at USD 3 million (K11.8 million) in 2015, based on a 1.25% levy on plantation revenues less a 5% royalty withholding tax.⁸⁴

Another group that can collect revenues from forestry operations are Landowner Companies. Under the Forestry Act, landowners wishing to develop a logging project, are required to incorporate, but instead of creating ILGs, some landholders choose to set up a so-called "landowner company", to receive financial benefits. Under the terms and conditions of the Timber Permit, revenues then accrue to the "landowners" rather than the Incorporated Land Groups.⁸⁵ Landowner companies then collect what is known as a Log Export Premium which is estimated at USD 10 million (K38.7 million) in 2015.⁸⁶

In the agricultural sector, landowners receive K75 / ha / year in rental payments for planted areas, and K20 / ha / year for unplanted areas. In addition, landowners receive royalty payments, fixed at 10% of the value of the crop based on the smallholder farm gate price (according to the FFB price formula).⁸⁷ In all cases, payments are made to the ILGs. In 2015, based on company information in West New Britain, landholder revenues from palm oil companies are estimated to be USD 5 million (K16 million) through royalty payments and USD 1

⁸¹ See e.g. <http://lands.gov.pg/Services/ILG/FAQ/FAQs.pdf>

⁸² Bird, N., Wells, A., van Helden, F. and Turia, R., 2007. What can be learned from the past? A history of the forestry sector in Papua New Guinea. London: Overseas Development Institute. *Papua New Guinea Forest Studies, 1*

⁸³ Borde, A., and Turia, R., 2016. Financial Flow of Land Use Sectors in Papua New Guinea

⁸⁴ Although this is the calculated amount presented in Borde, A., and Turia, R., 2016. Financial Flow of Land Use Sectors in Papua New Guinea, the basis for this calculation is not clear

⁸⁵ PNGFA, 2004. Towards Sustainable Timber Production – A Review of Existing Logging Projects. Prepared By: the 2003/2004 Review Team

⁸⁶ Borde, A., and Turia, R., 2016. Financial Flow of Land Use Sectors in Papua New Guinea

⁸⁷ KPMG, 2014. FFB Price Formula Review

million (K2.8 million) for land rental. Estimates from other commodities were not available for this study, so this figure is likely an underestimate of royalty revenues from the agricultural sector in general.

3.2.4 Provincial and local governments

The fourth and final group of actors are provincial and local governments. There are three levels of government in PNG, national, provincial and local level governments (LLG). Provincial governments received USD 1 billion (K3.6 billion) in direct transfers from the national government in 2015, which are intended to support basic services.⁸⁸ Both provincial and local governments can collect taxes and fees, for a range of community development projects.

With respect to climate-relevant land use, LLGs and provincial governments collect a **local-level government levy** and a **provincial government levy** that accrues directly to these entities. These revenues are equivalent to a royalty payment and are related to small scale logging licenses. In general, these levies are not financially transparent, and lack clear regulatory guidance but - according to the recent PNGFA report – these levies amounted to USD 1.5 million (K4.7 million) and USD 3 million (K 9.4 million) respectively in 2015, corresponding to a 0.5% and 1% levy on non-plantation logs less a 5% royalty withholding tax.⁸⁹

These revenues are clearly quite small, and the major stakeholder to engage with at the provincial level are PFCMs as described above. While PFCMs have a member from provincial governments on their board, these are not classified here as a provincial and local government flows, since they report to and are under the authority of PNGFA, and not to the provincial and local level governments.

3.3 Summary and discussion

In 2015, revenues from agriculture and forestry revenues totaled USD 0.59 billion (K1.6 billion) across a range of domestic financial instruments that accrue to four major groups (see Figure 15). Central government departments and agencies collected the largest share of these revenues (78%), with the remaining revenues accruing to landholders, and landholder associations (10%), and statutory authorities (11%). Provincial and local level governments collect less than 1% of total revenues.

⁸⁸ Department of Treasury, 2017. Vol 2a Table 1. http://www.treasury.gov.pg/html/national_budget/2017.html.

⁸⁹ *ibid*

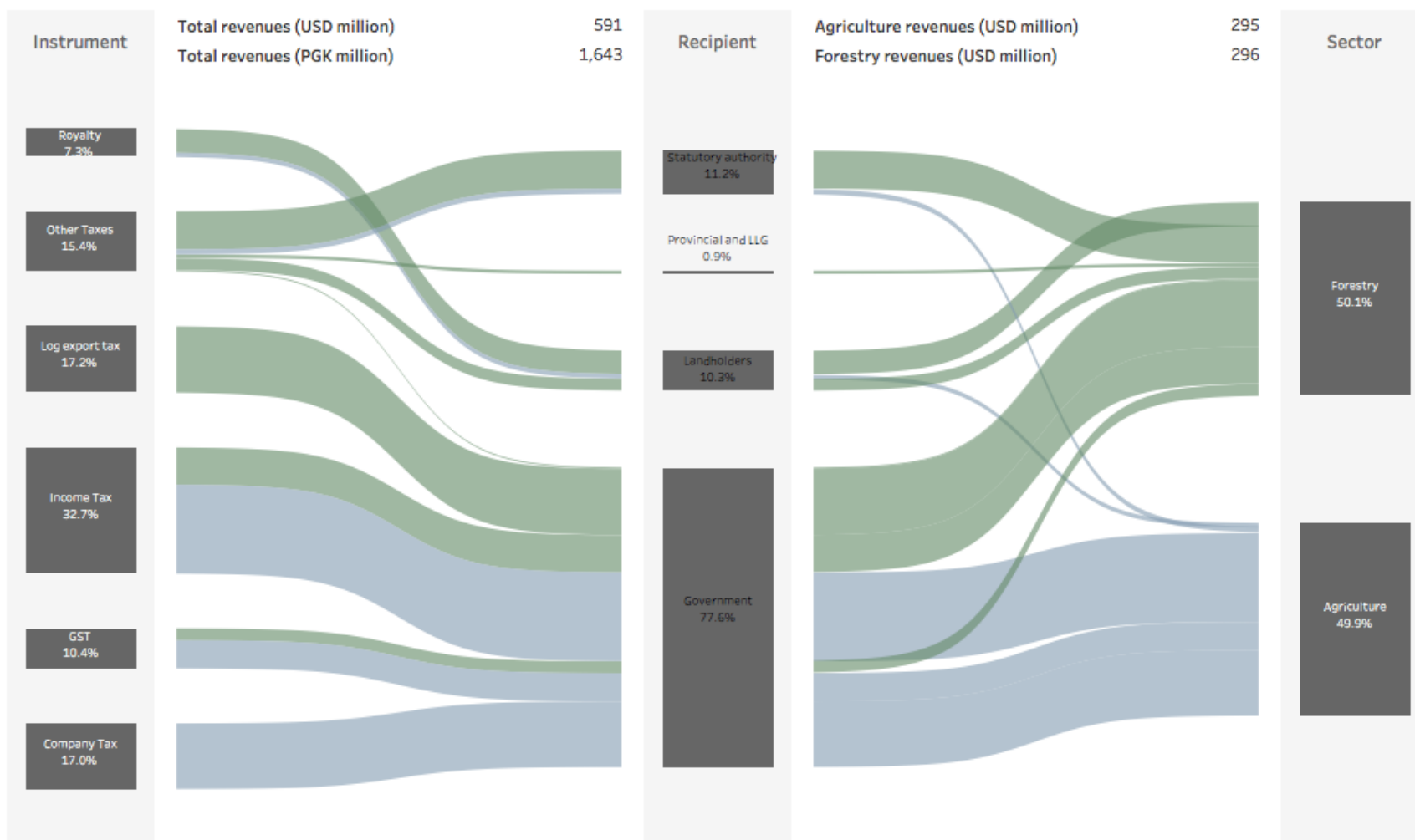


Figure 15 Revenue flows in climate-relevant land use activities showing: from the left-hand side, instruments used to collect revenues (GST = Goods and Services Tax); in the middle, recipients grouped into public corporations (e.g. OPIC, PNGFA), landholders and provincial governments, and government departments (e.g. IRC); and on the right, the two sectors these revenues relate to: agriculture and forestry.

Total revenues are split equally between the forestry (USD 296 million) and agricultural sectors (USD 295 million) despite the larger overall contribution of agriculture to the economy (11.7% compared to 4.7%). This is a result of the higher taxes and levies imposed on the forestry sector, in large part through the log export tax collected by the Bureau of Customs, which alone contributes USD 102 million (K280 million) to central government revenues.

Central government revenues from agriculture and forestry totaled USD 460 million (K1.3 billion) in 2015, equivalent to around 14% of overall government revenues.⁹⁰ This relatively high share of revenues reflects the importance of agricultural and forestry activities to the overall economy of PNG. Government revenues are collected through a combination of incomes taxes (33%), goods and services tax (GST) (10%), company tax (17%), and the log export tax (17%), and are not further hypothecated towards climate-relevant land use expenditures. There is therefore no linkage between these revenues and expenditures in agriculture and forestry as discussed in the next section.

Payments to landholders, and landholder associations - which are collected through a combination of royalty payments, and other taxes and levies - amounted to USD 61 million (K170 million) in 2015. Forestry royalties (USD 36 million) are far higher than agricultural royalties (USD 7 million) due to higher per-hectare levies in the forest sector, as well as a larger number of levies and taxes that are collected by landholder companies, and provincial and local governments. As with central government revenues, these payments are not used for further climate-relevant land use investments, and are intended for the benefit of the recipients of revenues.

Finally, PNG has a number of statutory authorities, including PNGFA, and other commodity boards, as well as CEPA that collected a total of USD 66 million (K184 million) in 2015 through a diverse number of individual taxes and levies. These revenues are highly skewed towards the forestry sector, and in particular to PNGFA, which collected around USD 58 million (K161 million), equivalent to 90% of revenues to statutory authorities, through a combination of revenues collected centrally under the Board and National Forest Service, and at the provincial level through levies collected by PFMCS.

3.3.1 Recommendations

In general, there is very little consistency in the collection of levies and taxes collected from climate-relevant land use sectors. Aside from the standard taxes collected by central government (i.e. GST, income tax, corporate tax), these financial instruments are developed and implemented in an ad-hoc, and fragmented manner across different layers of government, and customary landholders. Regularization of these levies would help to ensure both a fair and

⁹⁰ Total reported government revenues in 2014 were US 3.2 billion (K8.8 billion). Department of Treasury, 2017. Vol 2a Section (II) Details of Revenue, Grants and Loan Estimates http://www.treasury.gov.pg/html/national_budget/2017.html.

consistent tax basis for commodity production in PNG and could also be used to incentivize sustainable land use activities. The PNG Forest Industry Association (PNGFIA) for example, has suggested that organizations that are able to conduct reforestation activities themselves could forgo the reforestation levy.⁹¹ This is currently the case for Stettin Lumber Company, who conduct their own reforestation activities. Similar proposals have also been put forward for the palm oil industry levies on fresh fruit bunches. The regularization of taxes and levies, and ensuring consistency across sectors is an area for further research and is discussed further in the conclusion section.

As shown in Figure 16, the contribution from fees and levies collected by individual statutory authorities varies significantly across these institutions. The forestry sector, through PNGFA and PFMCS, collects by far the highest overall revenue (USD 19 million / K52.8 million and USD 36 million / K104 million respectively) and also has the largest number of individual levies that it applies.⁹² Levies collected by PNGFA also represent the highest percentage of overall export revenues at more than 6% of total log export revenue. This constitutes a relatively high tax on logging operations in PNG and is not consistent with other commodity levies in general. Concerns around the use of these levies will be discussed in Section 4.

⁹¹ http://www.fiapng.com/PDF_files/Report%20on%20Reforestation.pdf

⁹² PNGFA has three levies that it collects centrally, the Reforestation Levy, Forest Management Levy, and Log Export Development Levy

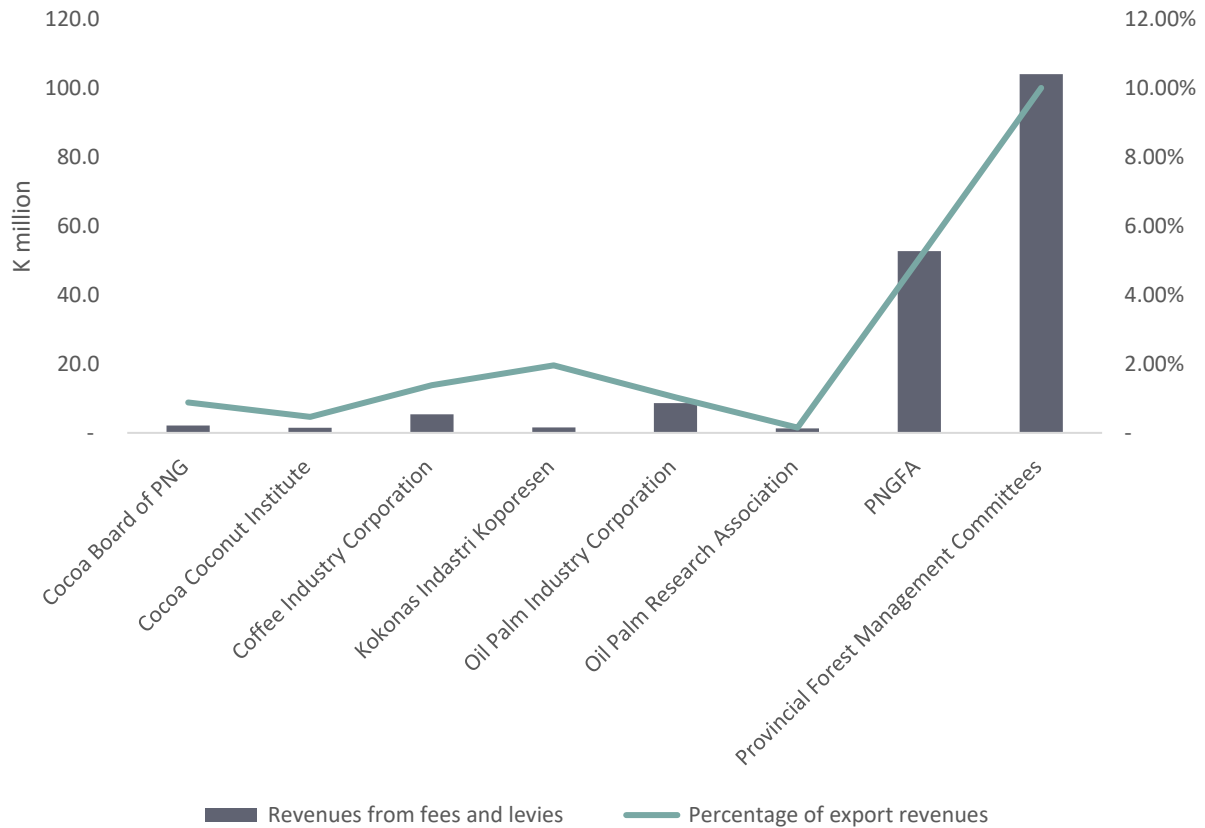


Figure 16 Revenues collected from major commodity boards in PNG and the percentage of these revenues compared to total export revenues

Despite being the largest export revenue, the oil palm sector has far lower overall levies, at just 0.14% (OPRA) and 0.84% (OPIC) of total export revenues. This could be a factor of the central role that plantation companies such as New Britain Palm Oil and Hargy play in providing extension services, such as training and equipment for smallholders, under the nuclear estate model that operates in PNG, and the reduced need for a centralized commodity board to fulfil these services. The revenues collected by both CIC and KIK are slightly higher in relation to overall export revenues (1.4% and 2% respectively), in both cases this is due to the high fixed price per tonne that these commodity boards impose.

In general, while undergoing considerable currency and price instability in international commodity markets, the major commodity boards in PNG have elected not to impose a percentage levy on export value. In contrast, the mining and petroleum sectors both apply a percentage-based levy on resource extraction. The development levy on oil and gas projects is set at 2% of wellhead value, and the production levy on mining projects is generally 0.25% of assessable income. These percentage based levies help to reduce the burden on producers and exporters in times of low export prices, and when commodity prices are high result in additional revenues to commodity boards themselves.

In addition, taxes and levies are applied uniformly to all producers, and neither incentivize sustainable production nor disincentivize unsustainable production. Instead, these taxes and levies could be linked to environmental performance indicators, such as compliance with a recognized certification standard such as the Roundtable on Sustainable Palm Oil (RSPO) or Forest Stewardship Council (FSC).

Finally, there is a degree of redundancy in the financial instruments used across commodity boards, and there have been several attempts to regularize the industry. Some of these redundancies exist across authorities: OPIC, for example has overlaps with OPRA in terms of its research and extension functions. Other redundancies exist within a single commodity board, PNGFA, for example collects three levies separately to the levies collected by Provincial Forest Management Committees and IRC / Bureau of Customs. These fragmented mechanisms create barriers for private sector engagement in forestry operations in PNG and also add complexities in terms of tracking and ensuring transparency of finance in climate-relevant land-use sectors.

To address these barriers, these commodity boards could consider a process of consolidation, to decrease the complexity as well as redundancy in levies and fees.⁹³ In addition, statutory authorities, such as PNGFA, that have a number of levies, could rationalize these levies, and clearly disaggregate management costs (collected through a management levy) and other hypothecated costs, e.g. reforestation, forest management etc. to ensure that these levies are appropriately managed and disbursed.

4 Landscape of land use finance in PNG

As described in the previous section, PNG collects revenues through a number of financial instruments related to climate-relevant land-use activities. In addition, PNG receives financial and technical assistance from international donors. Some of these revenues are used to incentivize climate-relevant land-use activities through grants subsidies and other financial mechanisms. The remainder of this section summarizes these expenditures according to sources, instruments, disbursement channels and end uses according to the diagram shown in Figure 17 below.

4.1 Key findings

Climate-relevant land use expenditures in 2015 totaled USD 157million (K436 million), of which around 13% or USD 21 million (K58 million) was aligned with climate change objectives, while 18% or USD 29.5 million (K82 million) was only conditionally aligned with climate change outcomes. The majority of finance (69%) was not classified as either conditional or climate-

⁹³ Department of Agriculture and Livestock, 2014. Towards Agriculture Transformation and a New Direction for Enhancing Productivity in Agriculture Functional and Expenditure Review of Agricultural Commodity Boards and Agencies

aligned in our analysis since it is either recurring government budget (USD 42 million) or general expenses under statutory authorities (USD 64 million) that was not earmarked to any given purpose.

Statutory authorities are the largest single disbursement channel for climate-relevant land use finance (73%). But, while statutory authorities manage the largest share of finance, there is very little transparency in the use of these funds with only 12% of funds being earmarked to a particular activity or purpose (as shown by the large grey flows in Figure 17). The majority of expenditures disbursed through statutory authorities are from taxes and levies collected directly from producers (56%), with government (44%) and bilateral donors (1%) providing the remainder. Despite collecting at least USD 18 million (K50 million) in fees and levies that are intended to be hypothecated towards climate-relevant land use activities⁹⁴, only one statutory authority (Coffee Industry Corporation) recorded disbursing finance – through its coffee freight subsidy - equivalent to USD 0.14 million (K0.4 million) in 2015.

Climate-aligned finance was delivered through a combination of multilateral donors, bilateral donors, and domestic government. Bilateral donors are the largest source of climate-aligned finance and provided USD 8.6 million (K24 million) across various projects in 2015. Multilateral donors and domestic governments disbursed USD 7.2 million (K20 million) and USD 5.3 million (K15 million) respectively towards climate-aligned land use activities. These expenditures related mostly to forestry and environmental protection activities, although some agricultural activities were also classified as climate-aligned due to a strong application of safeguards.

⁹⁴ This figure includes levies and taxes that are earmarked for climate relevant activities, e.g. the reforestation levy collected by PNGFA, or the palm oil levy collected by OPIC. It is difficult to assess how much of these levies should be earmarked towards further land use activities.

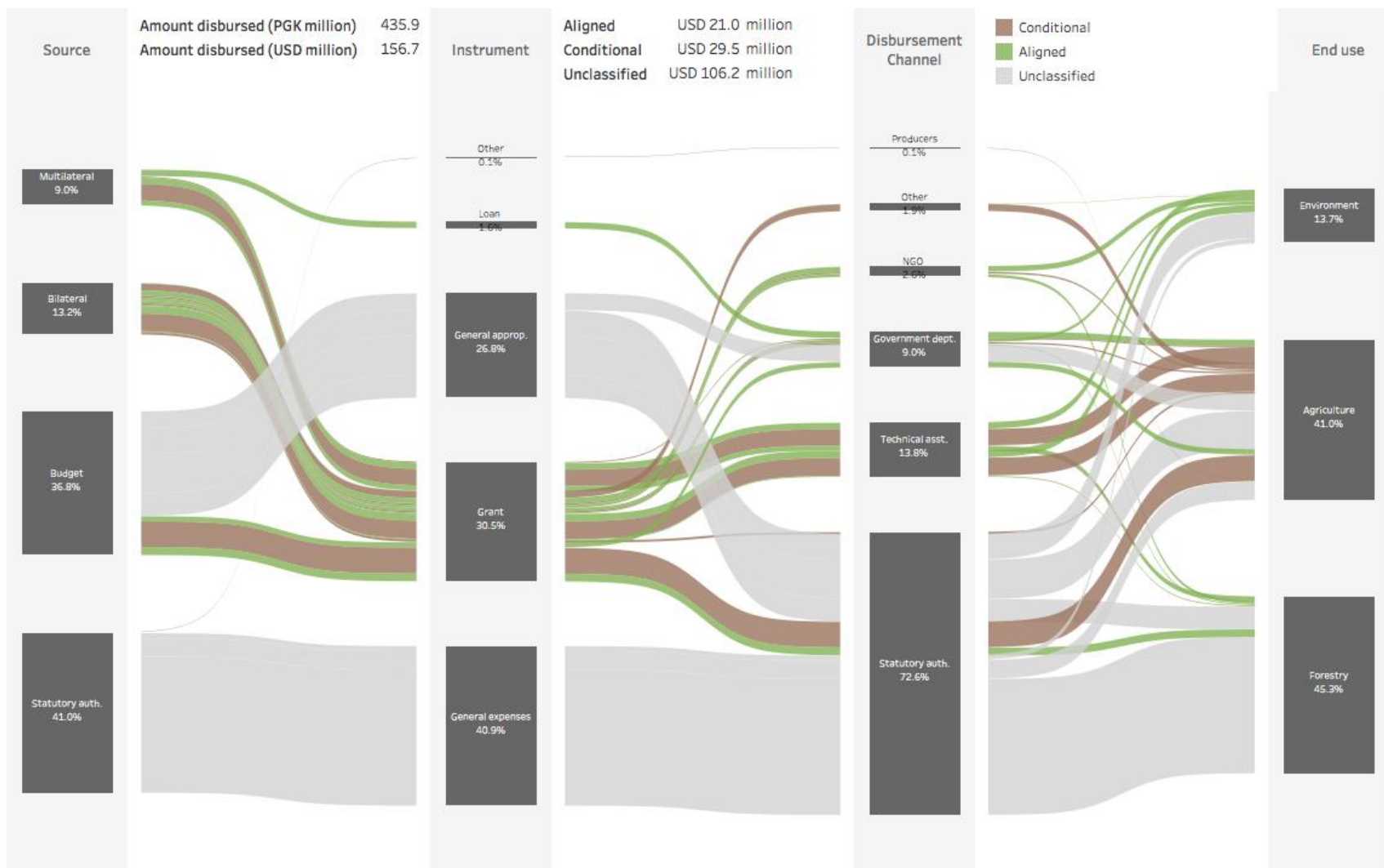


Figure 17 Landscape of climate-relevant land use finance in PNG in 2015 showing sources, instruments, disbursement channels and end uses. Total climate-relevant land-use expenditures in 2015 were USD 156.7 million (K435.9 million), of which USD 21 million were aligned with climate change objectives (green), and USD 29.5 million were only conditionally aligned with climate outcomes (brown). The majority of finance (USD 106.2 million) is unclassified since it is either from domestic recurrent budget, or general expenses of commodity boards without any attribution to climate change outcomes.

4.2 Sources of climate-relevant land use finance

This section describes the various sources of finance, and their relative contribution to climate-relevant land-use expenditures in PNG. In general, sources can be categorized into three broad groups:

- **Domestic public finance:** The government of PNG allocates budget directly to climate-relevant land-use activities through an annual appropriations process. This includes budget allocation to government departments and agencies, as well as contributions to statutory authorities, the majority of which are partially funded by government. We include all sources of domestic finance in our analysis, but only classify spending related to PIPs and specific activities as climate-relevant due to the challenge in attributing emoluments (salaries and travel) and goods and services (travel and other operating costs) to particular climate change outcomes.
- **International donor finance:** International donors also provide support to climate-relevant land-use activities in PNG through technical and financial assistance. International donors include bilateral development institutions such as Australia's Department of Foreign Affairs and Trade (DFAT) or Japan International Cooperation Agency (JICA) as well as multilateral development banks and international institutions such as the Asian Development Bank or UNDP. Donors can fund government departments directly (on-budget) and also provide funding directly to non-governmental organizations (off-budget).
- **Private sector finance:** The private sector finance climate-relevant land-use activities directly and indirectly in PNG. Our analysis captures indirect private sector finance that is first collected by either a government department, statutory authority, or local or provincial government as outlined in Section 3. Direct investments by the private sector in climate-relevant land-use activities are not quantified in this analysis due to a lack of data on this finance.

The remainder of this section discuss these three sources of finance and their relative contribution to climate-relevant land-use outcomes in PNG.

4.2.1 Domestic government budget⁹⁵

In 2015, national appropriations in PNG totaled USD 8.1 billion (K22.6 billion) across all sectors, the majority of which (92%) was from domestic government budget (see Figure 18).

International donors contributed USD 0.5 billion (K 1.4 billion) on budget and a further USD 0.2 billion (K 0.6 billion) (off-budget) directly to national and internationally based NGOs. The majority of appropriations are allocated to national departments (80%), and provincial

⁹⁵ The government of PNG accounts for domestic appropriations and international donor assistance jointly, some of the numbers presented here include donor assistance although this will be discussed separately in the next section.

governments (16%) with statutory authorities receiving just 4% (USD 0.5 million) in appropriations.

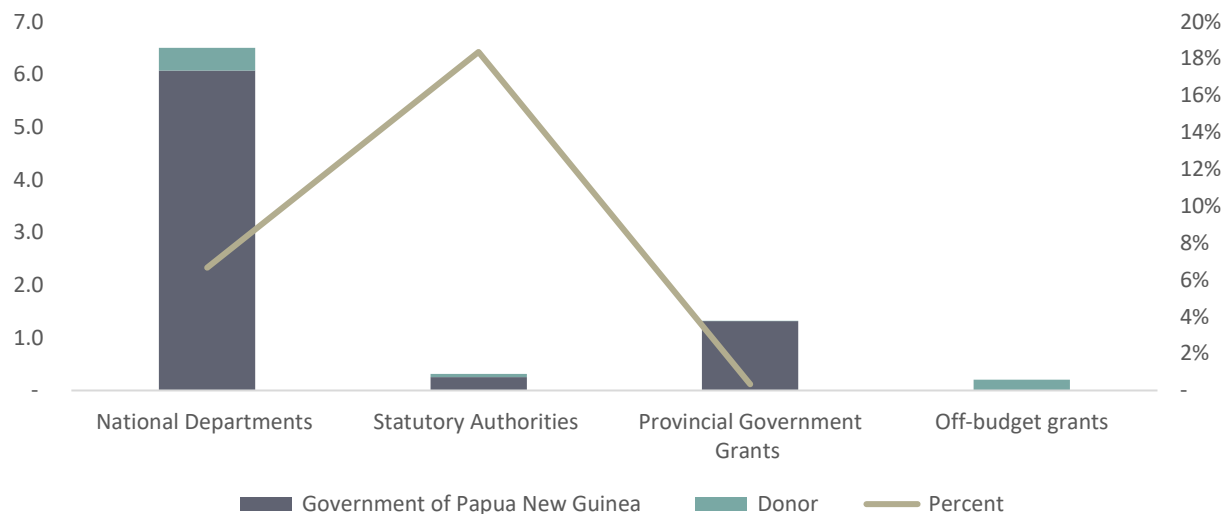


Figure 18 Total appropriations in PNG in 2015 grouped by major recipient and showing percentage contribution from international donors. Vol 2a Section (III) Details of expenditure summary of appropriation. Note, off-budget grants and other on budget grants are discussed in the following section.

Looking specifically at climate-relevant land-use sectors, appropriations in 2015 amounted to USD 60 million (K169 million), less than 1% of total government expenditures.⁹⁶ This relatively small percentage of overall finance is in part due to the privatization of commodities in PNG and the ability of statutory authorities to generate their own revenues. Although, as noted above, the Public Money Management Regularisation Act places considerable uncertainty over the future of these statutory authorities and their ability to manage their own finance.

In contrast to domestic appropriations in other sectors, the majority of in climate-relevant land-use appropriations (84%) are channeled through statutory authorities. Only one department, DAL, manages domestic appropriations equivalent to 16% of overall climate-relevant land-use appropriations. The largest departments and authorities managing appropriations in 2015 were PNG Forest Authority (USD 12.3 million), Department of Agriculture and Livestock (USD 9.4 million), Conservation and Environment Protection Authority (USD 9.6 million), and National Development Bank (USD 7.2 million). Together these entities managed around two thirds of total climate-relevant land use expenditures in PNG in 2015 (see Figure 19).

⁹⁶ This total includes donor revenues that pass through treasury and are on budget.

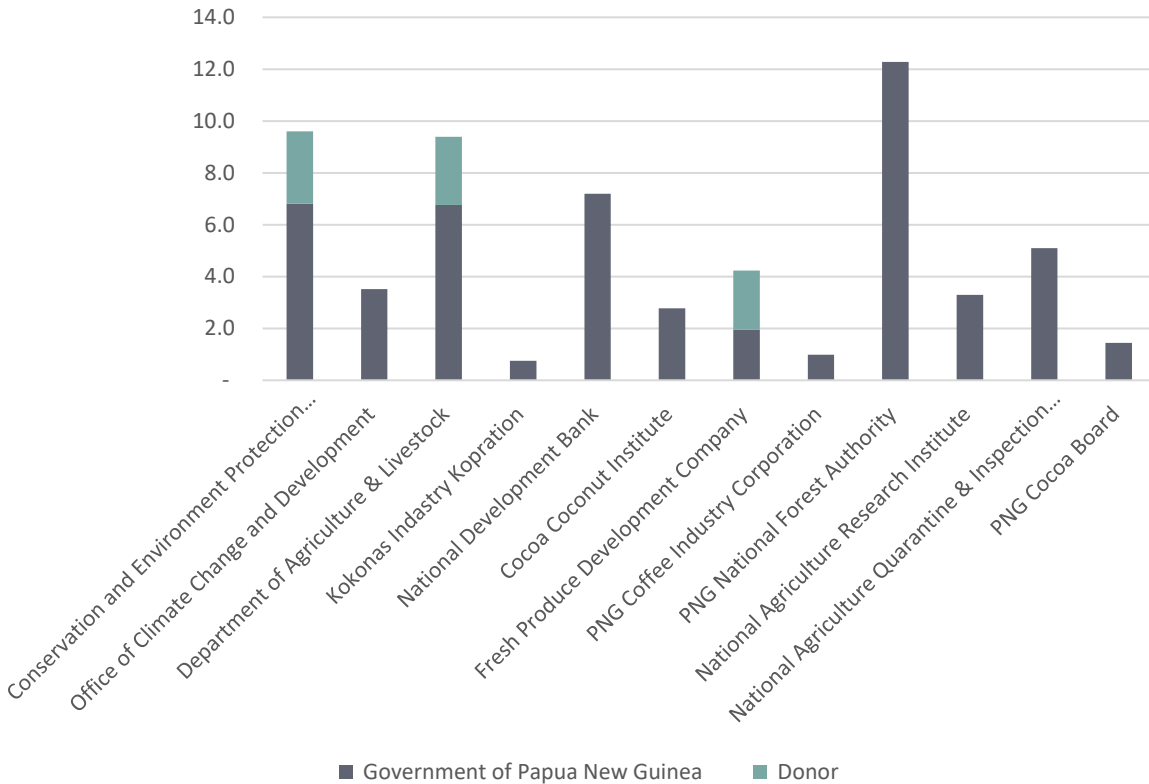


Figure 19 Total expenditures in 2015 across climate-relevant land use entities in PNG in K million. Total K169 million.

By far the largest allocation of domestic appropriations in PNG is to recurrent budget for general administration - including basic operational costs such as staff salaries, office rental, and travel and subsistence costs. In 2015, recurrent budget amounted to roughly a quarter of all climate-relevant land use expenditures, and 72% of domestic budget, equivalent to USD 42 million (K117 million). While some departments indicated how recurrent budgets are allocated to specific programs, there was a lack of consistency in reporting across government departments and statutory authorities. In addition, expenses reported in the audited 2015 budget did not correlate with expenses reported in audited AFRs creating further challenges in classifying these flows.

The remaining 28% of domestic appropriations are disbursed through Public Investment Programs, which amounted to USD 15.6 million (K43.4 million) in 2015. This figure is again very small (less than 1% of the approximately K7 billion across all PIPs), arguably because of the emphasis on self-generated finance through individual commodity boards in the agriculture and forestry sectors. Climate-relevant land use expenditures through PIPs are split across five institutions: National Development Bank, Department of Agriculture & Livestock, Cocoa Board of PNG, PNG Forest Authority, and Fresh Produce Development Authority. Of the USD 15.6 million around three quarters (USD 15 million) was provided through domestic government

budget and the remaining USD 5 million is from international donors. The rest of this section describes these PIPs and their relative alignment with climate-smart land-use outcomes.

The largest climate-relevant land use PIP resides with the **National Development Bank (NDB)** that oversees a K20 million/yr Agriculture and SME Funding program. The program aims to promote small businesses for ordinary Papua New Guinean's. While relatively little information could be found for this program, it is reasonable to assume that the NDB lacks the capacity to ensure that finance provided to Small to Medium Enterprises (SMEs) does not drive deforestation and this activity has therefore been classified as conditional.

The **Department of Agriculture & Livestock** oversees two projects, although only one of these disbursed revenues in 2015. The Productive Partnership for Agriculture Development (PPAD) project was co-funded by domestic budget USD 1 million (K3 million), a World Bank International Development Association (IDA) loan USD 1.2 million (K4 million), and a grant from the International Fund for Agricultural Development (IFAD) USD 1 million (K3 million) in the financial year 2015. The program runs for five years and aims to improve the livelihoods of smallholder cocoa and coffee producers through the improvement in the performance and sustainability of cocoa and coffee of value chains.⁹⁷ The project has been classified as climate-aligned because it supports sustainable yield improvement and has developed safeguard plans in target areas. A similar project, Market for Village Farmers, scheduled to begin in 2017 may face difficulties in ensuring that village farming has not led to forest conversion, and is an area for further research.

The **Cocoa Board of PNG (CBPNG)** has a number of PIPs, and while it did not declare any expenditures under the national budget, it does indicate three active PIPs in its AFR, which are government funded. The first of these is a cocoa quality project, which is deemed to be non-climate relevant since it only relates to the quality of existing cocoa production. The second relates to the establishment of provincial cocoa nurseries, to cultivate and distribute cocoa pod borer (CPB) tolerant seed varieties. The project is run in conjunction with CCI and had expenditures of K5.9 million in 2015. The third PIP is a freight subsidy program that disbursed K2.9 million in 2015. Both of these expenditures have been classified as conditionally aligned, since they could both lead to extensification of cocoa into forested areas.

The **PNG Forest Authority (PNGFA)** has two projects related to reforestation and improving the national forest inventory in its PIP, but did not receive any specific expenditures related to climate-relevant land use in 2015. Despite being the largest recipient of revenues (see Section 3), the only expenditure recorded in its AFR is a pass-through of USD 3 million (K8.7 million) for

⁹⁷ Data throughout on projects is taken from Department of Treasury, 2017. Vol 3 Public Investment Program 2017 – 2021, which captures 2015 actual expenditures. Available at http://www.treasury.gov.pg/html/national_budget/2017.html.

log export monitoring which is implemented by SGS. This has been classified as green since it increases the monitoring and enforcement of log exports in PNG.

The **Fresh Produce Development Authority (FPDA)** has a number of projects under its five-year development plan including a capacity building program related to export markets for garden farmers, the development of a potato industry, and reducing post-harvesting loss. As the main authority supporting garden farming, one of the major drivers of forest loss historically, FPDA is a key candidate for developing robust criteria related to climate-aligned land use activities in PNG. To date, only the Market Supply Value Chain program, is operational, and disbursed K6.3 million in grant funding in 2015. The project has been classified as conditional, since it makes no reference to conserving forests, yet has sold produce from nearly 2,000 smallholder farmers to date.⁹⁸

The newly established **Conservation and Environment Protection Authority (CEPA)**, declared no dedicated expenditures related to climate-relevant land use in 2015.⁹⁹ This could be due to the lack of established financial accounts¹⁰⁰, and/or due to delays in setting up appropriate processes within CEPA to effectively implement environmental monitoring and enforcement practices. CEPA holds a key function within PNG and it will be important in the future to set up these practices and to show transparently how fees that are collected from climate-relevant land use activities are being used.¹⁰¹

The **Coffee Industry Corporation (CIC)** also has a number of climate-relevant land use PIPs, including a freight subsidy scheme, protection against the coffee bean borer, and a coffee rehabilitation program. According to the 2015 actual budget data, however, these projects did not disburse any finance. Under its AFR CIC reports expenditures of K0.4 million related to a coffee freight subsidy to support coffee producers in remote areas. This expenditure has been classified as conditionally aligned due to a lack of information related to this activities safeguards. In theory, such a subsidy could drive deforestation by providing incentives to remote producers who are in heavily forested areas.

The newly established **Climate Change and Development Authority (CCDA)** has several PIPs that relate to climate-relevant land use, including REDD+ pilot projects, and the development of PNG's Intended Nationally Determined Contribution (INDC), but these had not disbursed any finance in 2015.

⁹⁸ This figure was not verified in the AFR, however the number from the budget has been used in this analysis.

⁹⁹ In addition to revenues collected from fees, CEPA's total budget allocation in 2015 was 27 million Kina

¹⁰⁰ We were unable to review an audited AFR for CEPA for any year.

¹⁰¹ CEPA is also mandated to collect decommissioning bonds from mines and petroleum operations, and ensuring fiscal transparency will be important for these sectors too.

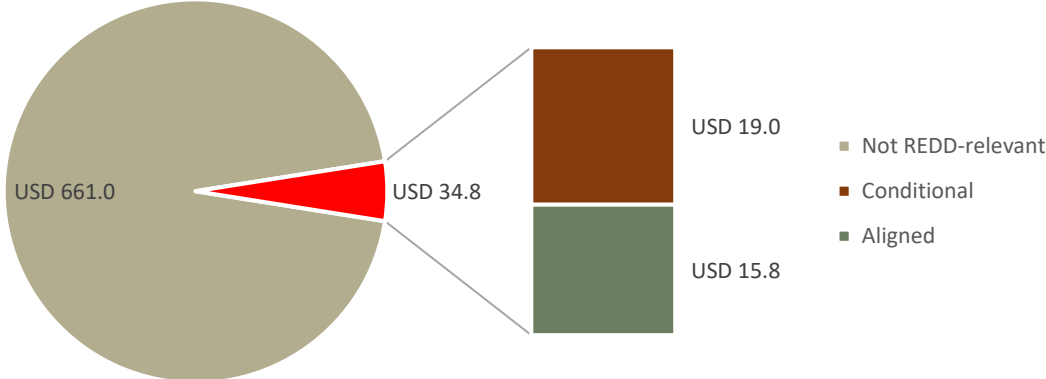
The **Kokonas Industri Koporesen (KIK)** reported no dedicated PIP expenditures in 2015, although it is planning market development activities and nurseries in 2017 and beyond. Under its AFR, KIK similarly only declared operational expenditures, without any reference to climate-relevant land use activities.

The **Oil Palm Industry Corporation (OPIC)** did not present any data in either the 2017 or 2015, and did not provide an AFR for this analysis. In 2014, OPIC concluded the Smallholder Agriculture Development Project (SADP), with lower than expected results.¹⁰² We have therefore assumed that OPIC had no climate-relevant land use expenditures in 2015.

Several smaller commodity boards, such as the **Cocoa Coconut Institute, PNG Rubber Board, National Agriculture Research Institute,** and **National Agriculture Quarantine & Inspection Authority,** were not included here since they did not declared any climate-relevant land use expenditures in 2015.

4.2.2 Bilateral and multilateral donors

In 2015, PNG received a total of USD 703 million (K2 billion) in official development assistance (ODA) from bilateral and multilateral donors across all activities and sectors.¹⁰³ The largest single donor was Australia, who disbursed USD 0.4 million (K1.2 billion), or 61% of all international aid in 2015. The majority of ODA, however, is not related to land use and climate change outcomes. Of this broader sum, only USD 28 million (K77 million) (3%) relates to climate-relevant land use outcomes, divided roughly equally between climate-aligned and conditional land use finance (see Figure 20).



¹⁰² Only 200 km out of the planned 440 km roads were actually repaired due to appreciation of the kina, rising costs, and project delays
¹⁰³ Data taken from OECD DAC Creditor Reporting System (CRS) database. See <https://stats.oecd.org/Index.aspx?DataSetCode=CRS1>

Figure 20 Total ODA disbursements in 2015 (USD 703 million) indicating component that is climate-relevant in red

The majority of international development assistance is provided through technical assistance (USD 10 million / K34 million), followed by NGOs (USD 4 million / K11 million), government departments (USD 4 million / K10 million) and statutory authorities (USD 3 million / K9 million). NGOs and government departments both have a relatively high percentage of climate-aligned land use finance (85%), while technical assistance has around 60% conditionally-aligned land use finance (see Figure 21). Two bilateral donor programs disbursed through statutory authorities have been classified as conditionally aligned, since they aim to increase the production of domestic subsistence farming and have not explicitly addressed the issue of potential expansion into forested areas.

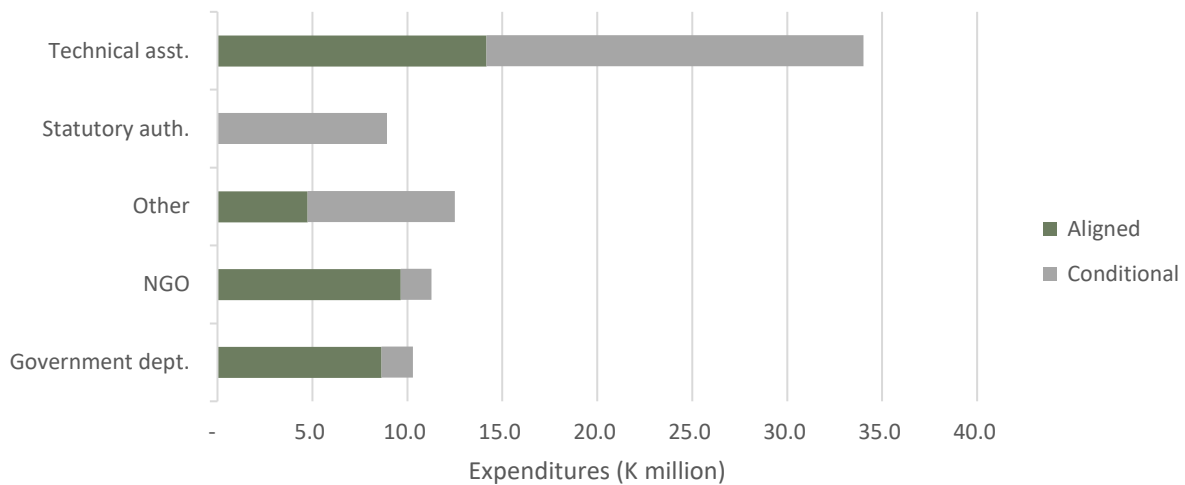


Figure 21 Disbursement channels of climate-relevant land use finance in PNG in 2015 indicating total expenditures that are aligned (green) and conditionally aligned (grey) with climate-relevant land use outcomes.

The **Australian government** is the largest single donor for climate-relevant land use finance (K23 million) primarily through technical assistance projects (K15 million). The majority of Australian donor finance (K21 million) has been classified as conditional due to a focus on broad based economic support and agricultural expansion with little information on safeguards related to forest conservation.

The second largest bilateral donor is **New Zealand** (K 9.5 million) that supports a number of agricultural projects through technical assistance, and grants to NGOs and statutory authorities. These projects equally failed to demonstrate clear safeguards related to the development of agricultural markets and their impacts on deforestation and have been classified as conditionally aligned, including a project co-developed with IFC.

The Japanese government, through **JICA** also funds a number of climate-relevant land use activities in PNG but these have been classified as conditional where they related to known drivers of deforestation, due to a lack of data in general on JICA funded projects.

Multilateral donors including the Global Environment Facility (GEF), IDA, IFAD and UNDP fund a number of climate-relevant land use programs in PNG totaling (K21 million). These expenditures, where they relate to potential drivers of deforestation and forest degradation, have been classified as climate-aligned in our analysis, since they indicate the use of safeguards to ensure against conversion of forests to other land uses. The Productive Partnerships in Agriculture Project, a multi-year, multi-donor project, for example, supports the adoption of certified sustainability practices to support sustainable agricultural practices

It is worth noting that while our analysis here has focused on agriculture, and forestry as the two primary sectors related to land use emissions in PNG, international literature points to the role of infrastructure in driving deforestation, and forest degradation in developing countries.¹⁰⁴ Including infrastructure, such as road building and rural electrification as potential drivers of deforestation would potentially add around USD 27 million (K76 million) of additional ODA, mostly from bilateral partners that might be classified as conditionally-aligned with climate-change outcomes.

4.2.3 Private sector finance

As noted in Section 3, PNG has a large number of taxes and levies collected through statutory authorities totaling USD 64 million (K178 million) in 2015, the majority of which are collected by PNGFA (USD 58 million / K161 million). While it is difficult to pinpoint an exact amount - due to opaque legislation - a number of these levies, estimated at USD 18 million (K50 million), are intended to be used through subsidies, and extension programs to support climate-relevant land use activities in PNG.

Given the significant role that these authorities play in PNG in collecting revenues for central government as well as for provincial and local communities, most if not all commodity boards should improve their standards of fiscal transparency, including reporting to both the Department of Treasury and the Department of Agriculture and Livestock. Currently, there is very little transparency related to who receives revenues and if they are equitably allocated. One approach could be to extend the remit of the Extractive Industries Transparency Initiative (EITI) to include soft commodity revenues such as agriculture and forestry products.¹⁰⁵ Although EITI primarily tracks hard commodities (i.e. mining, and fossil fuel extraction) it could be

¹⁰⁴ Puzio, L., 2015. Analysis of World Bank Finance & Forests: The Impact of Development Projects on Tropical Forests and Forest Peoples. Bank Information Center

¹⁰⁵ EITI works to improve the transparency of governance in extractive industries, including revenue collection and allocation. See <https://eiti.org/about/how-we-work>

expanded to track climate-relevant land-use finance. Particular focus should be given to timber exports and cash crops including coffee, cocoa, coconut and palm oil.

Finally, it is important to note the bottlenecks related to the disbursement of finance from statutory authorities. There are several explanations for this including corruption and misappropriation within coordinating institutions, a lack of awareness of funds and rights to access finance in recipients, and a lack of capacity to process requests to disburse finance¹⁰⁶. As noted above, in order to promote the effective use of funds collected through taxes and levies, there is a need for improved monitoring of funded projects as well as more public awareness about these funds and their purpose.

4.3 Financial mechanisms and instruments

Climate-relevant land use finance in PNG is delivered through a combination of public budget expenditure (27%), grants including PIPs (31%), general expenditures from statutory authorities (41%) and loans (2%),¹⁰⁷ with a small amount of finance (<1%) also traced through domestic subsidies.

4.3.1 Public private partnerships

PNG has a number of mechanisms that aim to directly incentivize private sector actors, through market support, or research and innovation. The National Development Bank's Agriculture and SME Funding program for example aims to provide finance to promote small businesses through a mix of small, large and microfinance loans. The Australian government has a number of programs including a markets development facility program that provides support for broad-based economic growth and rural development in PNG, and the Incentive Fund¹⁰⁸, which aims to attract high-performing organizations through a number of sectors including agriculture and rural development.

There are inherent trade-offs in the financing of these development projects that can often result in negative environmental and social impacts especially where foreign aid supports domestic fiscal policy through structural adjustment loans, credit support, and direct project lending.¹⁰⁹ There are many reasons why agricultural and forestry market development projects should be pursued in PNG, but these projects and programs should be screened through either safeguards assessments, or environmental impact assessments to ensure that they do not contribute to further deforestation.

¹⁰⁶ See e.g. Hamago, L., Ezebilo, E., 2017. The Log Export Development Levy in Papua New Guinea: Are We Using it to Develop Infrastructure?

¹⁰⁷ No information was available on the concessionality (i.e. interest rate and duration) of these loans.

¹⁰⁸ <http://incentivefund.org>

¹⁰⁹ Kaimowitz, D. and Angelsen, A., 1999. The World Bank and non-forest sector policies that affect forests: background paper for the World Bank's Forest Policy and Strategy. *Bogor, Center for International Forest Research*.

4.3.2 Domestic subsidies and extension services

PNG has a number of domestic subsidies and extension services that are supposed to be provided by statutory authorities to support climate-relevant land-use activities. Due to a lack of financial transparency across statutory authorities, however, as well as poor accounting procedures, we were unable to verify the actual provision of these services by the vast majority of statutory authorities.

Two commodity boards, as discussed in Section 4.2 (Coffee Industry Corporation and Cocoa Board of PNG), provide **freight subsidies** to remote producers, which may lead to further deforestation by incentivizing production in heavily forested areas. We were unable to verify whether other services such as reforestation or sustainable forest management, which should be conducted by PNGFA were being conducted, and to what extent finance that is collected through levies was being used to support these activities.

To avoid misappropriation of funds, disaggregation of management costs and clear regulations on the allocation of funds, can help to ensure that these funds are being well spent. CIC's management levy, for example is supposed to be divided roughly equally between operations and regulation (40%), research (30%) and for grower / extension services (30%). In practice, however, the majority of funds have been captured for operations and regulations.¹¹⁰

In addition, to ensure that subsidies do not lead to deforestation, the provision of finance through subsidies could be tied to sustainability standards, including those being promoted under the Productive Partnerships in Agriculture Project, to ensure that producers receiving financial incentives are not doing so in areas that were recently forest land.¹¹¹ The application of these standards, and appropriate coordination with incentives would require a degree of sophistication across commodity boards, which may require some initial scoping and capacity building.

4.3.3 Infrastructure tax credits

Finally, as discussed in Section 3.2 infrastructure tax credits (ITCs) applied under the Tax Credit Scheme (TCS) are used as a mechanism in PNG to provide basic infrastructure services through private sector implementation. In relation to climate-relevant land use outcomes, infrastructure tax credits are difficult to classify. On the one hand, they could contribute to climate change outcomes, e.g. by improving access to agricultural production and therefore increasing yields. On the other hand, ITCs could also result in additional deforestation e.g. by opening up roads to new areas, and making them more accessible to drivers of deforestation. Furthermore, these

¹¹⁰ Department of Agriculture and Livestock, 2014. Towards Agriculture Transformation and a New Direction for Enhancing Productivity in Agriculture Functional and Expenditure Review of Agricultural Commodity Boards and Agencies

¹¹¹ A number of standards exist with varying strengths and weakness related to the implementation of safeguards related to climate-relevant land use, see e.g. Stanley, L., Roe, S., Broadhead, J., Parker, C., (2015) *The Potential of Voluntary Sustainability Initiatives to Reduce Emissions from Deforestation and Forest Degradation*. Produced by Climate Focus for USAID's LEAF Program.

expenditures are primarily targeted at development and are therefore not easily classified as land-use expenditures. Finally, there is no breakdown of these revenues and expenditures by sector or by activity at the central government level, and this lack of information makes the first two points academic. As such, ITCs are only discussed in this report qualitatively but are an area for further research.

4.4 End uses supported

4.4.1 Forestry

In 2015, the largest share of climate-relevant land-use finance in PNG (45%), equivalent to USD 71 million (K197 million) was directed to forestry activities. The vast majority of this finance (USD 64 million) was unclassified and comes mostly from revenues collected directly by PNGFA through its taxes and levies. The remainder of finance (USD 7 million) is classified as climate-aligned and comes from domestic budget and bilateral and multilateral donors. Donor funded forestry programs include a large-scale program to update the National Forest Inventory, and a variety of sustainable timber and other forest product support programs. Domestic budget allocation amounts to USD 3.1 million (K8.7 million) and funds only one activity, which is the recurring log exporting monitoring program implemented by SGS, and administered through PNGFA.

In general, in spite its potential to generate revenues without driving further deforestation, very little finance is earmarked for timber processing and value chain development. One project funded by Australia and implemented by ACIAR, for example, aims to improve the balsa value chain, but otherwise timber processing and forestry value chain development is an area for potential expansion.

There is significant room to improve both the transparency of accounting within PNGFA, as well as redirect these flows to ensure that when finance is allocated to forestry activities it is used - to the extent possible - to support climate-relevant land-use outcomes. If some portion of the USD 55 million (K152 million) collected by PNGFA could be allocated towards climate-change outcomes this would scale up funding significantly for climate-relevant land-use outcomes.

4.4.2 Agriculture

The next largest share of climate-relevant land use finance in PNG (41%), equivalent to USD 64 million (K179 million) is allocated to agricultural production. Around a half of agricultural finance (USD 30 million) was unclassified, the majority of which comes from domestic recurrent budget (USD 22 million). Agriculture also has the largest share of conditional finance (USD 29 million), which is provided through a combination of bilateral (USD 12 million), multilateral (USD 7 million) and domestic budget (USD 10 million) (see Figure 22).

The majority of these conditional flows are related to enhancing livelihoods and increasing production of both cash crops and subsistence agriculture. These activities are recognized as being primary drivers of deforestation in PNG and have therefore been classified as conditionally aligned. One agricultural program funded by BMZ was classified as climate-aligned as it specifically aimed to address resilience of subsistence farmers and is labelled as a climate change adaptation project.¹¹²

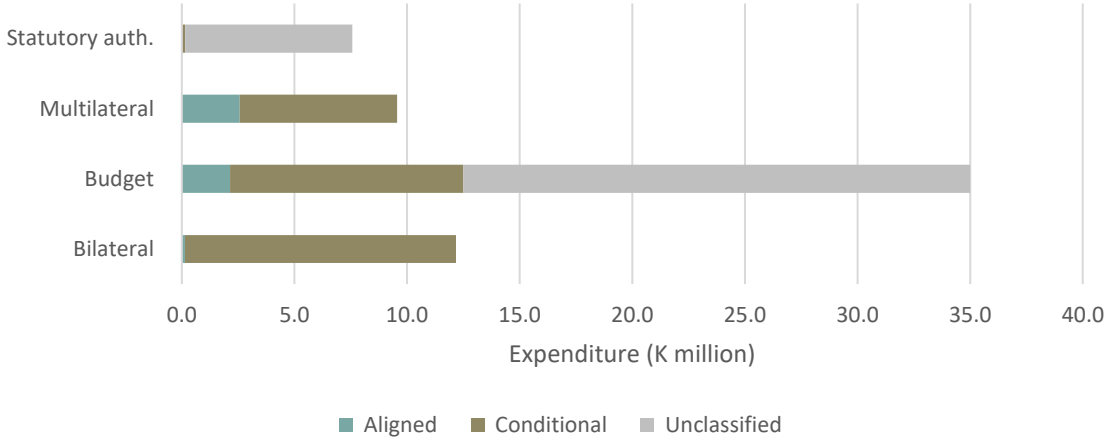


Figure 22 Sources of climate-relevant agricultural finance in PNG in 2015, indicating total expenditures that are aligned (green) and conditionally aligned (grey) with climate-relevant land use outcomes.

Three agricultural activities funded by domestic government have also been classified as conditionally aligned with climate change outcomes and constitute 91% of domestic agricultural PIP budgets. These three activities are the National Development Bank line of credit for agricultural projects discussed above, and the establishment of provincial cocoa nurseries and a remote areas cocoa freight subsidy scheme funded through the Cocoa Board of PNG, which have no clear safeguards related to avoided forest conversion.

The only domestically funded agricultural program that has been classified as climate-aligned is the Productive Partnership for Agriculture Development program, and is jointly funded by IDA and IFAD. As discussed above, the program has implemented safeguards and conducted environmental impacts assessments to ensure that road development and extension services do not result in forest conversion.

Regarding specific commodities, for the most part projects do not specify a particular commodity that they are developing, although all of the major commodities are covered in one form or another under the various activities being financed.

¹¹² The OECD DAC CRS database includes “Rio markers” that donors can use to classify projects against the three Rio Conventions (UNFCCC, UNCCD, CBD)

4.4.3 Environment

The remainder of finance (USD 21 million) is allocated to environmental programs and again around a half of this was unclassified (USD 12 million / K34 million). The remainder of environmental programs (USD 9 million) are classified as climate-aligned.¹¹³ Bilateral donors in 2015 allocated a higher percentage of finance to environmental programs (72%), compared to multilateral donors (28%) although this is in part a question of taxonomy rather than the substantive nature of these programs (i.e. some donors label activities as environment rather than forestry). Examples of donor funded environmental programs include conservation projects in protected areas, capacity building programs related to forest monitoring, biodiversity and climate change, and climate change resilience programs.

¹¹³ Given the lack of transparency in JICA funding, it is difficult to say if these activities relate to the forestry sector, but they have been classified here in the same way as other donor finance for simplicity.

5 Conclusion and recommendations

Forestry and agriculture are the two main drivers of forest cover change and land use emissions in PNG, yet - under sustainable management practices - these sectors are central to economic growth and livelihoods, especially in rural populations. The trade-offs between these two objectives is an issue that the government of PNG is considering carefully, through the development of its NRS and its associated REDD+ finance and investment plan.

This paper analyses the major flows of climate-relevant land use finance in PNG, to understand how revenues and expenditures can be redirected to align with climate change outcomes, while continuing to support livelihoods, and support economic growth. The main recommendations in this report are summarized below.

5.1 Policy recommendations

Re-evaluate the current log export tax collected by IRC and conduct an economic review of forestry in PNG. The current log export tax rate, which is set at 28.5%, generates around 3% of government revenues. The tax rate, however, is far higher than taxes on other industries and creates an uneven burden on the forestry sector. Higher taxes on the forestry industry lowers overall returns, which attracts less sustainably-minded companies and promotes tax avoidance through transfer pricing and declaring offshore earnings.¹¹⁴ An in-depth economic review of the forest sector is needed, to establish fiscal reforms that the forestry industry would support, and to align the economic objectives of the government with the climate change goals set out in PNG's Nationally Determined Contribution.¹¹⁵ This review should include, *inter alia*, recommendations for reforming the log export tax, improving the sustainable management of forests, and creating a better incentive system for increased domestic processing of timber.

Improve traceability of royalty payments, levies, and taxes as well as income tax, company tax and infrastructure tax credits in climate-relevant land use sectors. Considering the central role that agriculture and forestry play in the economy of PNG, and the potential for corruption and misappropriation of finance at multiple levels, increased financial transparency is needed across agricultural and forestry activities. The simplest approach would be to extend the remit of the Extractive Industries Transparency Initiative (EITI) to include soft commodity revenues such as agriculture and forestry products.¹¹⁶ The initiative could begin with central government revenues, including those collected by statutory authorities, and extend to royalty payments made to landholders and provincial and local governments. The initiative could also explore the use of Infrastructure Tax Credits (ITCs) under the Tax Credit Scheme (TCS) and the transparency of reporting and accounting for ITCs and other tax breaks and tax holidays in the agricultural

¹¹⁴ Mousseau, F. and Lau, P., 2015. The great timber heist: the logging industry in Papua New Guinea.

¹¹⁵ This might be based on the review conducted by PwC in 2006. PwC, 2006. Economic Analysis and Potential of PNG Forestry Industry.

¹¹⁶ Information on EITI in PNG can be found here <https://eiti.org/papua-new-guinea>

sector. A further area for increased transparency would be the development of a national registry of land title to link companies to areas of deforestation (or sustainable production), and a register of beneficial ownership, which would minimize potential for corruption in company ownership structures.

Review and consolidate the operations of statutory authorities, including a more rational approach to the collection of taxes and levies and transparency in the use of proceeds.

Statutory authorities operate with a high level of independence, which has resulted in an overlapping and opaque system of taxes and levies in PNG. The Public Money Management Regularisation Act which has laid the foundation for a review and reform of these statutory authorities beginning with a review of their financial management. Building on this act, and other research¹¹⁷, these entities should be reviewed to understand how finance is being collected and disbursed, and based on these findings, a system of reform proposed to rationalize their operations. Without pre-judgement, this should prioritize major commodity export authorities, and in particular PNGFA, that captures the largest revenues from climate-relevant land use companies.

Redirect current taxes, levies and subsidies that can be applied by statutory authorities or central government departments to be more climate aligned. Subsidies, taxes and levies in PNG have little differentiation in the type of actor receiving or providing finance. These financial mechanisms could be targeted more directly at climate change outcomes by applying levies and taxes only on certain actors. The reforestation levy for example, could be waived by companies wishing to conduct their own reforestation activities, other tax breaks could be provided to companies demonstrating climate-aligned land use impacts. Similarly, freight subsidies could be targeted only to producers that demonstrate sustainable production practices, i.e. by not clearing forested land to produce commodities. This might also be an opportunity for the agriculture and forestry sector to support reform of the Tax Credit Scheme (TCS) moratorium to allow ITCs to be used to support sustainable land-use activities. Such a reform process would require research, coordination and capacity building between and within statutory authorities and central government departments.

Ensure donor safeguards are being applied in rural development and broad-based economic support programs. Given the inherent trade-offs between rural development and forest conservation, donors providing support to livelihoods-based activities and broad-based economic growth, i.e. activities that might indirectly lead to deforestation, should conduct additional assessments to minimize and control unwanted deforestation impacts. The government of PNG also needs to ensure that its own development is aligned with climate

¹¹⁷ The following report has detailed recommendations on reform of commodity boards in the agricultural sector, Department of Agriculture and Livestock, 2014. Towards Agriculture Transformation and a New Direction for Enhancing Productivity in Agriculture Functional and Expenditure Review of Agricultural Commodity Boards and Agencies

change outcomes, which will support the process of donor alignment. Reviewing the application of donor safeguards could take a number of approaches, including improved design of donor programs to specifically screen for environmental impacts, or targeted, individual environmental impact assessments when disbursing finance. The current portfolio of donor projects should be initially screened, beginning with major bilateral donors, to develop a system for future projects and programs. The development of a high conservation value (HCV) / high carbon stock (HCS) map, to inform zoning and land use planning could help in the application of safeguards within specific projects or programs.

5.2 Further work

Our initial analysis and landscape has focused on two major sectors, agriculture and forestry that are considered climate-relevant in the context of PNG's national REDD+ strategy. Further analysis could be conducted, however, in sectors that may impact forest emissions that are not captured in our current analysis. The two most important sectors not considered here, are energy (specifically wood energy) in relation to current emissions from burning wood fuel, and infrastructure, including roads, bridges and transmission lines that increase access to forests but can at the same time contribute to yield increases and increased productivity in agricultural producers. The impacts of these sectors needs to be more thoroughly researched before an analysis of their financial flows could be conducted.

A further limitation of this study is the lack of data related to climate-relevant land use finance at the sub-national level. Our team conducted initial research in two pilot provinces: Madang and East New Britain (ENB) that are targeted for REDD+ activities, however very little information was available at the provincial level on land use related activities. Further research could be conducted, however, on Provincial Forest Management Committees, and Incorporated Land Groups that are among the highest recipients of climate-relevant land use finance in PNG, and collect revenues that are intended to be further hypothecated to land use activities.

Finally, further work is needed to disaggregate central government revenues, and understand how these relate to climate change outcomes. A priority should be given to improving data on company income tax, personal income tax, and infrastructure tax credits as they relate to climate-relevant land use, in addition to marking of specific projects and programs within central government budget appropriations, to determine if they impact climate-relevant land use outcomes.

5.3 Conclusion

PNG could align an additional USD 29.5 million (K82 million) with climate change outcomes, by safeguarding existing climate-relevant land use finance. PNG has a number of financial instruments that target agricultural and forestry activities. In 2015, climate-relevant land use expenditures totaled USD 157 million (K436 million), but only 13% of these expenditures or USD

21 million (K58 million) were aligned with climate change outcomes. The majority of conditionally-aligned flows could be “greened” by applying more rigorous safeguards in donor and domestic finance, and ensuring that incentives and programs are protecting and conserving forests in PNG.

A further USD 18 million (K50 million) could be directed to climate-relevant land use activities through better application of taxes and levies from statutory authorities. Commodity production in PNG is overseen by statutory authorities who collect taxes and levies independently of government to support commodity producers. These bodies have become too disconnected from government, however, and although they collected over K175 million in revenues from producers and exporters in 2015, only USD 0.14 million (K0.4 million) of this was transparently disbursed through extension services and subsidies to commodity producers. Reforming only those levies that were intended to be earmarked for producers could generate an additional USD 18 million (K50 million) for climate-relevant land use outcomes.

Additional donor finance will be needed to support these transitions and align current financial flows with climate-relevant land use outcomes. To achieve these policy reforms, coordination will be needed between government departments, statutory authorities and the private sector that will require additional donor resources. This could include capacity building processes for government departments, as well as technical support, e.g. to develop smallholder extension services or support for climate-aligned land-use mapping and zoning. These resources, which will come from both national and international donors and experts, have the potential to unlock significant finance for climate-aligned land use in PNG.

Annex I: Financial Data

Revenue data

SECTOR	INSTRUMENT	TOTAL REVENUES (USD MILLION)	TOTAL REVENUES (PGK MILLION)
AGRICULTURE	Environment Management Fee	0.3	0.9
	Export Levy	1.5	4.2
	Fresh Fruit Bunch (FFB) Levy	3.1	8.7
	Goods and Services Tax (GST)	43.3	120.3
	Individual Income Tax (Assessed)	136.1	378.6
	Licenses and Fees	0.5	1.4
	Management Levy	1.2	3.2
	Nursery sales	0.3	0.9
	OPRA Levy	0.5	1.4
	Registration Fees	0.1	0.3
	Royalty	6.8	18.9
	Sales	0.4	1.0
	FORESTRY	25.5% log export tax	101.5
Agriculture		3.4	9.4
Business Development Levy		3.4	9.4
Education & Training		3.4	9.4
Environment Management Fee		1.7	4.7
FMA L/Os Management Levy		4.2	11.8
Forest Management Levy		3.4	9.4
Future Generation		4.2	11.8
Goods and Services Tax (GST)		18.1	50.4
Individual Income Tax (Assessed)		57.0	158.6
Infrastructure Development Levy		1.7	4.7
Local Level Government		1.7	4.7
Log Export Development Levy		10.5	29.3
Log Export Premium		13.9	38.7
Project Development Benefit*		14.6	40.6
Provincial Government		3.4	9.4
Reforestation Levy		5.1	14.1
Royalty		36.2	100.5
Royalty 5% with-holding tax		1.9	5.3
Shelter Levy		3.4	9.4
Spiritual Development	3.4	9.4	

Expenditure data

SOURCE	NAME	CLIMATE RELEVANT	AMOUNT DISBURSED (USD MILLION)	AMOUNT DISBURSED (PGK MILLION)
ASDB SPECIAL FUNDS AUSTRALIA	Strategic Program For Climate Resilience Implementation Project	Conditional	0.02	0.06
	Bogia Coconut Syndrome In Papua New Guinea	Conditional	0.03	0.09
	Broad-Based Economic Growth And Rural Development In Papua New Guinea	Conditional	3.31	9.20
	Building Resilience of Communities in Manus	Aligned	0.38	1.04
	Coconut Genebank Research in Papuan New Guinea	Conditional	0.09	0.26
	Community Planted Timber Industry	Aligned	0.02	0.04
	Enhancing Community Forestry Papua New Guinea	Aligned	0.28	0.77
	Floriculture To Improve The Livelihoods of Indigenous Communities in Papua New Guinea	Conditional	0.01	0.03
	Global Agriculture and Food Security Program 2014-15 Private Sector Pilot: Improving Incomes And Food And Nutrition Security In Low-Income Countries	Conditional	0.40	1.10
	Improved Management Strategies For Cocoa In Papua New Guinea	Conditional	0.17	0.47
	Improving Balsa Value Chain	Aligned	0.05	0.15
	Improving Coffee-Based Production Systems For Smallholder Farmers In Papua New Guinea: A Scoping Study	Conditional	0.05	0.13
	Incentive Fund Phase IV: Expand Service Delivery and Economic Development in Papua New Guinea	Conditional	1.31	3.64
	Integrated Crop Management Strategies in the Pacific	Conditional	0.03	0.08
	Kokoda Initiative April 2013 - June 2016	Aligned	2.89	8.04
	Long-Term Management Of Basal Stem Rot Of Oil Palm	Conditional	0.11	0.31
	Markets Development Facility Papua New Guinea	Conditional	1.26	3.50
	Milne Bay Co2 Seep: Research Into the Effects of Long-Term Exposure to High Carbon Dioxide	Aligned	0.05	0.13
	Papua New Guinea Canarium Nut Industry	Aligned	0.02	0.07
	Phama Scoping And Design	Conditional	0.05	0.15
	Product and Market Development for Processed Sweet potato	Conditional	0.01	0.02
	Promoting Traditional Vegetable Production And Consumption	Conditional	0.11	0.30
	Reducing Losses In Sweet Potato Production	Conditional	0.02	0.05
	Small Scale Feed Milling in Papua New Guinea	Conditional	0.10	0.27
	Small-Scale Feed Milling Papua New Guinea	Conditional	0.01	0.04
	Strengthening Livelihoods Amongst Cocoa And Oil Palm Farming Communities	Conditional	0.11	0.31
	Sustained Development Of The Papua New Guinea Sweetpotato Post Harvest And Marketing	Conditional	0.10	0.27
	Using Floriculture To Improve Livelihoods	Conditional	0.00	0.01
	Value Added Wood Processing In Papua New Guinea Supports Research Into Enhancing Value Added Wood Processing In Png	Conditional	0.10	0.27
	Working With Women Smallholders In Horticulture Improving Women's Business Acumen Will Result	Conditional	0.09	0.26

CLIMATE INVESTMENT FUNDS	STRATEGIC PROGRAM FOR CLIMATE RESILIENCE IMPLEMENTATION PROJECT	Conditional	0.06	0.16
	Agricultural Innovations for Improved Livelihoods in the Highlands region	Conditional	0.84	2.35
	Generation and adaptation of improved agricultural technologies to mitigate climate change imposed risks to food production within vulnera	Conditional	0.36	0.99
	Mid Term Review Evaluation Rural Economic Development Programme Phase I	Conditional	0.02	0.06
	Rural Infrastructure Improvement in the Highlands Region (component 1 RED 2)	Conditional	5.69	15.83
	Technical support to the Papua New Guinea Forest Authority to implement a multi purpose National Forest Inventory	Aligned	2.04	5.67
	FRANCE	RECH : Ressources, milieux et leur biodiversité	Aligned	0.00
GERMANY	Enhancing Food Security and Resilience of Subsistence Farming Communities /Papua New Guineaä	Aligned	0.14	0.38
	Promoting FSC Certification in Papua New Guinea	Aligned	0.09	0.26
	Responsible forest management in Papua New Guinea, continued	Aligned	0.14	0.38
	Responsible Land and Forest Use Through Village Based Enterprise Development, Continuation	Aligned	0.13	0.35
	Responsible Management and Maintenance of Forest Resources through community-based timber business	Aligned	0.05	0.15
	Sustainable forest management in Papua New Guinea , continued	Aligned	0.11	0.31
GLOBAL ENVIRONMENT FACILITY	R2R Strengthening the Management Effectiveness of the National System of Protected Areas	Aligned	2.19	6.08
	Strengthening Capacities to Measure, Report and Verify Indicators of Global Environment Benefits	Aligned	0.17	0.46
GOVERNMENT BUDGET	Agriculture and SME Funding	Conditional	7.19	20.00
	Cocoa Coconut Institute recurring budget	Unclassified	2.46	6.84
	Cocoa Quality Project Grant-GoPNG PIP	Aligned	1.07	2.99
	Conservation and Environment Protection Authority recurring budget	Unclassified	6.81	18.95
	Department of Agriculture & Livestock recurring budget	Unclassified	6.77	18.82
	Establish Provincial Cocoa Nurseries Project	Conditional	2.12	5.91
	Fresh Produce Development Company recurring budget	Unclassified	1.95	5.42
	Kokonäs Industry Kopratiön recurring budget	Unclassified	0.35	0.98
	National Agriculture Quarantine & Inspection Authority recurring budget	Unclassified	5.09	14.17
	National Agriculture Research Institute recurring budget	Unclassified	3.30	9.18
	Office of Climate Change and Development recurring budget	Unclassified	3.51	9.77
	PNG Cocoa Board recurring budget	Unclassified	1.60	4.44
	PNG Coffee Industry Corporation recurring budget	Unclassified	0.99	2.75
	PNGFA recurring budget	Unclassified	9.16	25.47
	Productive Partnership for Agriculture Development	Aligned	1.07	2.99
	Remote Areas Cocoa Freight Subsidy Scheme	Conditional	1.03	2.87
	SGS log enforcement	Aligned	3.13	8.70

INTERNATIONAL DEVELOPMENT ASSOCIATION	ADDITIONAL FINANCING FOR PRODUCTIVE PARTNERSHIPS IN AGRICULTURE	Aligned	2.57	7.15
JAPAN	TC AGGREGATED ACTIVITIES	Aligned	1.66	4.62
		Conditional	0.60	1.66
KOREA	2015 Master's Degree Program on Community Development Leadership(1)(15-1	Conditional	0.08	0.23
	Advanced Agricultural Technology Study and Training	Conditional	0.00	0.01
	Advanced Agricultural Technology Study and Training for Developing Count	Conditional	0.01	0.04
	Development and Dissemination Project of the Agricultural Appropriate Te	Conditional	0.34	0.95
	ICT d improvement livelihoods of the poorest on rural areas	Conditional	0.11	0.31
	PIC Special Training on Climate Change	Aligned	0.01	0.02
NEW ZEALAND	Agriculture Investment and Support Programme	Conditional	0.14	0.38
	Bogia Smallholder Market Access	Conditional	0.27	0.76
	Bougainville Community Economic Mobilisation	Conditional	0.15	0.42
	Fresh Produce Supply Chain Investment	Conditional	0.03	0.08
	Gordons Market Upgrade	Conditional	0.35	0.97
	PNG Fresh Produce IFC Cultivating Opportunity	Conditional	1.39	3.88
	Saraga Market Development Port Moresby	Conditional	0.93	2.58
	Sustainable Agriculture and Community Resilience	Conditional	0.16	0.44
NORWAY	Karawari rainforest habitat	Aligned	0.43	1.19
	Land is life	Aligned	0.32	0.88
	Managalas Conservation Area Project	Aligned	0.67	1.86
	Protect the environment & indigenous rights	Aligned	0.35	0.97
	REDD+ Governance and Finance Integrity - Papua Ny Guinea	Aligned	0.09	0.25
	Resource- and human rights in Papua New Guinea	Aligned	0.30	0.84
	Rights-based rainforest protection	Aligned	0.28	0.79
STATUTORY AUTHORITIES	Agriculture	Unclassified	3.38	9.41
	Business Development Levy	Unclassified	3.38	9.41
	Education & Training	Unclassified	3.38	9.41
	Environment Management Fee	Unclassified	2.03	5.64
	Export Levy	Unclassified	1.35	3.75
	Forest Management Levy	Unclassified	3.38	9.41
	Freight subsidy	Conditional	0.15	0.41
	Fresh Fruit Bunch (FFB) Levy	Unclassified	3.13	8.70
	Future Generation	Unclassified	4.23	11.76
	Licenses and Fees	Unclassified	0.51	1.42
	Log Export Development Levy	Unclassified	10.52	29.25
	Management Levy	Unclassified	1.16	3.23
	Nursery sales	Unclassified	0.32	0.90
	OPRA Levy	Unclassified	0.49	1.35
	Project Development Benefit*	Unclassified	14.61	40.63

	Reforestation Levy	Unclassified	5.07	14.11
	Registration Fees	Unclassified	0.11	0.31
	Sales	Unclassified	0.35	0.98
	Shelter Levy	Unclassified	3.38	9.41
	Spiritual Development	Unclassified	3.38	9.41
UNDP	Community Forest Conservation	Aligned	0.12	0.32
	PNG AF 4552:Climate Resilience	Aligned	0.10	0.28
UNITED KINGDOM	Building biodiversity research capacity to protect Papua New Guinea rainforest from logging	Aligned	0.03	0.09
	Complete Altitudinal Rainforest Transect for research and conservation in PNG	Aligned	0.11	0.31

Annex II: Stakeholder consultations

Inception meeting

Date: 6-10 November 2017

Venue: Conference Room, Rapopo Resort,

Place: Kokopo, East New Britain, Papua New Guinea

Table 3 Bilateral stakeholder consultations conducted during inception meeting

ORGANISATION	CONTACT PERSON AND JOB TITLE
European Union Delegation	Carlos Battaglini, Attaché / Environmental & Agriculture Programme Manager Hefung Hati, Program Manager
Department of Treasury	Allan Kapi Gipsis, Acting First Assistant Secretary, General Economic Policy Division Elizabeth Noki
Department of Finance	Eileen Gini, Assistant Secretary - Budget Policy Unit Dominic Ira, Deputy Secretary (Strategy)
PNG National Forest Authority	Stephen Nukuitu, Deputy Secretary (Operations) Dambis Kaip, Manager, Policy and Aid Coordinator Branch Alois Jenkihau Policy Officer, Policy & Aid Coordination Branch Joseph Badi, Manager Acquisition Branch Constin Bigol, Manager, Mapping and Planning Elizabeth Helali, Senior Projects Officer, Policy and Planning Elizabeth Kaidong, Adaptation & Low Carbon Growth Officer
FAO	Dr Abe Hitofumi, Chief Technical Adviser, EU/NFI/FAO
Department of Agriculture and Livestock Conservation and Environmental Protection Authority	Stephen Mombi, Deputy Secretary, Agriculture Development Division Daisy Lepon, Principal Policy Advisor, Economic, Research, Policy, Planning, Programming, Michael Bongro, Director, Donor Coordination and Special Projects
Department of National Planning and Monitoring	Floyd Lala, Assistant Secretary - UN/EU Regional Programs and Development Effectiveness Branch, Foreign Aid Division
Department of Petroleum and Energy	Kepsey Puiye, Acting Secretary
Department of Commerce, Trade and Industry	Agnes Martin, Assistant Secretary, Industry Assistance Branch Industry Division John Rina, Principle Development Officer
Department of Foreign Affairs and Trade, Australian High Commission	Darian Clark, First Secretary Nige Kaupa, Program Manager (Development Cooperation) Operations DFAT
USAID Pacific Islands	Julie Hulama, Development Assistance Specialist
Asian Development Bank (ADB)	Yurendra Basnett, Country Economist
JICA	Margaret George, Senior Program Officer
Forest Industry Association	Bob Tate, Executive Officer
New Britain Palm Oil Limited	Ian Orrell, Head of Sustainability
World Bank	Allan Oliver, Operations Officer, - Sustainable Development
Bank of Papua New Guinea	Joe Teria, Assistant Governor, Finance & Payments Group Rosalie Tawaiole, Personal Assistant Grethel Mogi Personal Assistant to the Governor
PNG Power Limited	Togaro Asiba, A/Director Strategic Planning & Business Development
Oil Search Limited	Nerida Gauci, Gas Business Development & Sustainability Megan Christensen, General Manager Stakeholder Engagement & Social Responsibility Kepore, Kymberley, Executive Officer, Oil Search Foundation
Investment Promotion Authority	Clarence Mala. Hoot, Acting Managing Director Ulea Monei, a/ES

PNG Extractive Industries
Transparency Initiative
Ernst & Young

Elizabeth Solien
Lucas Alkan , Head of National Secretariat

Pieter Steyn, Director & Assurance

Draft report consultation meeting

Date: 21-25 May 2018

Venue: Conference Room, Gazelle International,

Place: Kokopo, East New Britain, Papua New Guinea

NAME	TITLE
MR. KWAIPO VALI	Director, Renewable Resources
MS. GWEN SISSIOU	General Manager, REDD+ & Mitigation
MS. EUNICE DUS	Senior REDD+ Officer
MS. SONIA BAINE	REDD+ Officer
MS. LEILANI KAMBUOU	REDD+ Officer
MR. PAUL HASAGAMA	MRV Officer, MRC/NC, CCDA
JACQUIE AITSI	Administration Assistant, REDD+ & Mitigation Division, CCDA
MR. JONAH AUKA	Manager- Projects Branch and GCF Focal Point, Adaptation and Projects Division
MR. GEWA GAMOGA	REDD+ & Climate Change Officer
MR. MILLER KAWANAMO	Ecologist/REDD+/CDM, Forest Research Institute
MR. GOODWILL AMOS	Manager – REDD+ & Climate Change
MR. ALOIS JENKIHOU	Policy Officer - Policy & Aid Coordination Branch
MR. JERRY KOWIN	Area Manager - Area West
DONALD TARERE	PNGFA – ENBP Kerevat Forester
ELIZABETH M’BULEAU	PNGFA Kerevat Forester
MR. WAN RUIN	Technical Supervisor, PNGFA-NGI ENBP
DR. ERIC OMURU	Technical Consultant and Advisor, DAL
MS. DAISY LEPON	Policy Advisor Economic, Research, Policy, Planning, Programming, Budgeting & Coordination Branch
MR. ALEX GINENT	a/Assistant Secretary, UN/Regional & Aid Coordination Branch, Foreign Aid Division, DNPM
MR. LINUS BILLY	Acting Physical Planner, Department of Lands and Physical Planning
MS. WELENIE YAKI	Manager-Physical Planning Policy, Office of the Chief Physical Planner
MR. ANDY MALO	Director, Customary Leases
MR. STANLEY TEMAI	
MS. DORISH LOVARE	Acting Assistant Director Legal Advisory Branch
MS. MICHIKO KWAIMANI	Senior Legal Officer
MR. STANLEY TEMAI	Project Environment Officer
MRS. KILA KALA	Manager Trusts - Compliance, Trusts Accounting Branch, Financial Controls Division Department of Finance
MS ANNA AVU BAI	FAS-Aid Reform and Coordination Division
MS. LOIS STANLEY	Director – Drafts and Advisory
DR. RAMA KRISHNA	RDC, NARI, Laloki Research Station
DR. PETER GENDIA	NARI, Laloki Research Station
MATHEW POIENOU	Senior Scientist-NARI (Kerevat Branch)
LEROY MORIPI	University of Technology
DANIEL WALDI	Forestry Lecturer
JAUPO MINIMULU	Forestry Technical Officer

ALEX GREG NUGI	Head of Estate & Farms-PNGUNRE
JERRY ANAE	UOG/Academic Staff
PATRICK MARTIN	PhD Scholar-UNSW
MR. DESMOND VAGHELO	Environment officer – WNBPA
MR. JEREMIAH SOKAIM	Climate Change Officer-WNBPA
MR. JERRY TARUTIA	Research & Marketing Officer
HENRY KAHORASO	ENBP-DPI, Gazelle District
HOSILA TURBARAT ORONG	Provincial Livestock Officer-DPI ENBP
JANE LARME	Env & Conservation Officer-ENBPA
JOAN MAGAGA	Rural Development Officer-ENBP
FLORENCE PAISPARA	Coordinator- Forest & Environment
WILLIAM RAUWAL GWAISEUK	Planning & Economic Adviser
MISBIL WARTOVO	NGI Regional Director-DAL
GLADIS PINIAU	NGI Regional DAL- ICT Adviser
THOMAS KADORA	ENBPA-Prov. Agriculture Officer
ELLY KALAVA	ENBPA-Information & PR Unit
DON TOKUNAI	ENBPA-PDC
HELLON CO-OP	ENB-NBC Programmer
APELIS MUNUPEN	Rural Development Officer-ENBPA@Gazelle District
BLAISE MAGAGA	ENBPA-PDAC
HENRY TAVUL	ENBPA-Commerce
JOYCE LINGE GUAN	ENBPA-Lands Advisor
MR. FRANK SOPLA	Acting Forestry Adviser
MR. RUDOLF MUNGALEE	Provincial Disaster Coordinato
MR. DAISUKE KADOWAKI	JICA Technical Advisor
MS. MARY BONI	Senior Programme Officer, CIMC
MR LESTER SERI	Policy Officer, Wildlife Conservation Society
MR. KELLY K. KALIT	Government Relations & Policy Officer, TNC
MR. BENJAMIN SIPPA	Live & Learn
JOHN RABBIE	Project Officer-OISCA, ENBP
BENJAMIN SIPA	Live & Learn PNG
ALEX KUAKIRI	OISCA International
NORBERT PERRY	OISCA International
FRANCIS LEBA	OISCA International
SHARON NERIUS	IOM Operations Assistant-Disaster Risk Reduction
CLIVE PASSINGAN	Community Development Facilitator-Barefoot
SEBBY MAHUI	Central Inland-Pomio
HOWARD MERAVEKA	Area Manager-NPMA
MR. SIMON PETER	Compliance Manager, RH
MAE VILLAFLO	Forester, Open Bay Timbers
GRACE LABARRGAN	Tzen Nuigini Limited
MR. TOBIAS WAMBU	Oil Palm Industry Corporation
SOPIE GETT	Hargy Oil Palm Limited-Sustainability Manager
DR JOEL SCRIVEN	REDD+ Regional Technical Advisor, UNDP Bangkok Regional Hub

MR. MIRZOHAYDAR ISOEV	FCPF Technical Advisor
MR. PETER KATAPA	FCPF Project Manager
MR. SAM MOKO	PNG Palm Oil Platform National Coordinator
MR. JORDAN BULO	PNG Palm Oil Platform Technical Specialist
MR. SAMSON KUPALE	Communications Officer
MS. DOE KWARARA	Admin/Finance Project Associate
DR. GAE GOWAE	National Consultant on the development of REDD+ Strategy
MR. PHILIP COWLING	International Consultant on the development of REDD+ Strategy
MR. CHARLIE PARKER	International Consultant on Financial Mapping
MR. PETER KAVIAGU	National Consultant on Financial Mapping

