Strengthening the capacity of
decision making on REDD+ in
Papua New Guinea

Strategic assessment of international climate finance and investment opportunities for REDD+ and sustainable land management in PNG

May 2019

Prepared for

UNDP Papua New Guinea

Executive Summary

The opportunity

- **Significant international climate finance opportunities are imminent.** Pending final policy design, new international climate finance frameworks (e.g. the New Market Mechanisms under the UNFCCC, and Carbon Offset Reduction Scheme for International Aviation - CORSIA) will present substantial opportunities for Papua New Guinea (PNG) to tap into and support sustainable resource management projects in its forestry, agriculture (and fishery) sectors – providing jobs and economic growth, boosting food security, and helping meet international and domestic climate change commitments e.g. its Nationally Determined Contribution under the UNFCCC Paris Agreement, and those contained in PNG's National REDD+ Strategy and Medium Term Development Plan III (for example).
- **The private sector is showing enormous interest in sustainable agriculture and forestry investments.** Investors are requiring new finance criteria be met to mitigate the downside legal, market and reputational risks associated with goods and services that degrade environmental assets e.g. conventional forestry. This is increasingly being reflected in assessments by Credit Rating Agencies (e.g. Moody's and S&P), statements by regulators, powerful investor disclosure initiatives (e.g. CDP), and ultimately, in higher insurance premiums. This change in investor sentiment is nudging producers and supply-chain managers to seek alternative business models that improve environmental and social conditions, and that address consumer concerns e.g. chemicals in food, deforestation and waste.
- **International climate finance will unlock even larger amounts of private sector investment.** International climate finance will fuel co-financing opportunities, whereby significant private sector impact investment can "piggy-back" off other public-sector money (e.g. WorldBank, GCF, GEF and via National Government bilateral agreements such as with Australia) if PNG's policy and governance settings are right. Government funding acts to de-risk innovative sustainable resource management business models. De-risking such projects is critical in both industrialised and developing countries, but especially so for PNG if it is to capture a share of these finance flows.
- **PNG has a strong sustainability story to tell impact investors**. Its forests and other ecosystems (much of which are ecologically in-tact) are a significant contributor to climate change mitigation, it harbours a rich array of biodiversity, and, its people maintain strong cultural connections. Conventional business models that destroy natural ecosystems are being phased out.
- **PNG's natural and social capital, and its geostrategic location, are its comparative advantages.** When climate finance orientated impact investors (both from the public and private sectors) look at PNG, they see a strong business case for co-investment in projects and programs that not only return a market-rate financial return, but that also result in verifiable and brandable co-benefits such as climate change mitigation, biodiversity conservation and community livelihood. PNG is also seen as geopolitically strategic investment by several nations.

The challenge

- **However, capturing a share of these financing opportunities is far from guaranteed for PNG**. Like for other investment opportunities in PNG, there are underlying and persistent barriers to attracting climate finance for sustainable land management in PNG. These key investment barriers include: inadequate frameworks and systems to provide robust governance and financial transaction transparency; relative high difficulty and risk of doing business in PNG; high transaction costs; and, too many climate finance related policy proposals, creating confusion.
- **To be ready to capture these big finance opportunities, PNG must (and can) deal with these barriers.** If GoPNG fails to act decisively, it risks losing out to other countries with a less risky business development profile. This includes neighbouring countries in the Pacific, some of whom have taken advanced action to position themselves as attractive climate finance investment destinations.

What PNG needs to do to position itself as an attractive climate finance and impact investment destination

PNG will not be able to achieve its REDD+ goals, and more broadly establish a financially and environmentally sustainable agriculture and forestry industries of the future by relying only on grants from multilateral and bilateral climate finance sources. Private impact investment will be needed. In the short-term, PNG will need to rely on upfront grant funding from sources that have an appetite for high-levels of risk (e.g. World Bank, GCF, GFE) to slowly but surely put in place the building blocks that will mitigate investment risk and encourage FDI in projects that have REDD+ benefits. This report provides seven building blocks (key recommendations) below. Many of these recommendations have previously been provided by other reports – hence this report emphasizes that there is consensus on investing in these actions.

➢ Step 1 - Establish strong systems of governance, and clear channels of responsibility

In Summary

- The first step is to clarify which agency/agencies in GoPNG have the responsibility for coordinating a whole-of-government response to tapping into international climate finance.
- Then, institutional capacity must be developed so the relevant agencies can mount an effective response to doing so.
- A consistent message to external message on who holds responsibility is critical to reduce uncertainty.

The Detail

As many recommended by several studies, it is critical that PNG develops strong systems of governance that provide transparency around the climate finance and investment deal making process. This includes GHG accounting and verification systems, community benefit sharing systems and embracing certification standards (e.g. FSC) to clearly and robustly show that benefits have been created and where they are being distributed within PNG. The RFIP being developed by UNDP provides a detailed budget breakdown on the actions and investment requirements required to put in place strong governance systems related to sustainable land management and REDD+. These actions include (amongst mang others) [1]:

- "Establishing a National Sustainable Land Use Planning Framework;
- Development of spatially explicit subnational development plans;
- Strengthening the application of PNG's Timber Legality Standard;
- The regulation of small-scale timber operations;
- Increasing sustainable Palm Oil and Cocoa production; and,
- Increasing the capacity of PNGFA for policy development planning, training and research".

A report by UNDP in 2015 provides a useful start to development a national climate finance benefit sharing a distribution system. Such systems of governance are not only important for upholding key obligation to donors and investors that financial benefits are being distributed fairly and transparently to relevant stakeholders (e.g. local communities), but also to maintain a social license to operate and demonstrate the credibility of the entire system (and its industries) to the people of PNG. This report provided the following recommendations for next steps on developing a national climate finance benefit sharing distribution section (which will be advanced by the UNDP soon):

- "The National Executive Council (NEC) should establish an Independent Oversight Board (IOB) to be accountable to international donors and to have the legal authority to conduct oversight of all aspects of the REDD+ Programme;
- The IOB should create the National Climate Change Trust Account as one of their first major tasks [*note, the creation of a National Climate Change Trust Account is discussed further below*];
- The IOB should finance one national activity and one subnational activity through the National Climate Change Trust Account and monitor how the system receives and distributes payments;
- A team of Community Development Experts (CDEs) for each province where REDD is being implemented should be hired and managed by the Office of Climate Change and Development [*note, this was replaced by the CCDA*]; and,
- The IOB should establish an Ethics Committee which would then create procedures for resolving conflict at the national level. The IOB would also request the CDEs to create village level resolution process".

More discussion on how a national benefit sharing distribution system will interaction with a national environmental trust fund is provided in the following sections.

Another lingering and critical barrier to climate finance (and ultimate impact investing) is the lack of coordination, information sharing and understanding of accessing climate finance and investment in GoPNG between technical and central agencies, and between GoPNG and civil society, the private sector, training institutes and international development partners (including UNDP). This lack of coordination is creating planning deficiencies that make it difficult to know where to prioritize limited investments to maximize the economic, social and environmental benefits.

As noted by a climate finance options paper developed by the Department of National Planning and Monitoring (DNPM)[76], at present there is no national coordination mechanism on climate change or climate finance. The *Climate Change Management Act 2015* provides for a National Climate Change Board (NCCB) – as of September 2018, the NCCB had never met. The DNPM report also suggests that the role of the NCCB does not include coordination, and that with the increased in scale and sources of finance "there is an expectation for the Government of Papua New Guinea to improve its coordination with partners and internally between government agencies and with non-state actors".

The first recommendation of the report by DNMP is to "*clarify roles and responsibilities of key government agencies, private sector, NGOs, research and training institutes, and development partners in climate finance, through the updated Climate Change Management Act"*.

In the meantime, and despite limited resourcing and capacity (see below) the CCDA remains the centre point for most coordination and discussion of climate finance policy frameworks, and project assessment. The DNMP report then makes the following important recommendations to share the burden of coordinating climate policy and finance initiatives:

1. "Agree to use the Consultative Implementing and Monitoring Committee (CIMC) Natural Resources Sectoral Committee (NRSC) as an inclusive platform to facilitate the discussion of project ideas to be submitted to CCDA as well as reporting on climate change projects to be incorporated in the national budget.
2. Consider amending the name of the NRSC to align to the budget categorization of sectors and open up membership to other government agencies and relevant non-state actor stakeholders.
3. Ensure that the NRSC only discusses issues that cannot be resolved in existing technical committees/working groups, and particularly those that may require high-level decisions through the DNPM quarterly consultative mechanism.

4. Government encouraged to utilise the local technical expertise that exist in research institutes/universities to support project development and enhanced access, project appraisal, monitoring and evaluation, capacity development, research and innovation and policy advice.
5. The Development Partners Round Table, with support from DPNM, should encourage the participation of other key development partners/donors.
6. Endorse the proposed national coordination mechanism on climate finance and its associated processes.
7. Endorse the proposed functions of the National Steering Committee on Climate Finance and the Technical Working Group on Climate Finance, as well as the role of CCDA and DNPM in driving the coordination mechanism.
8. Agree that the proposed coordination mechanism is specific to climate finance and climate change and will not replace or disrupt the existing channels of communication and engagement for broader development cooperation, as well as the committees identified in the Climate Change Management Act.
9. Approve the TORs for the National Steering Committee on Climate Finance (NSCCF) and the Technical Working Group on Climate Finance, the Project Approval Process and the Project Profile Form.
10. Agree that the NSCCF will task the Technical Working Group on Climate Finance to develop additional procedures, forms, policies and templates to successfully implement the coordination mechanism, as and when appropriate".

➢ Step 2 - Build capacity in GoPNG, and the broader community

In Summary

- Ultimately, GoPNG's agencies (including CCDA) need more money to employ more people.
- GoPNG should focus on assessing, pitching and implementing these ideas internally, with the view that the investment in time will yield greater investment and capacity for the CCDA and other relevant agencies to more fully capture the larger opportunities presented by international climate finance.
- Once capacity has been increased, it must fully develop a coordinated strategy for tapping into international climate finance flows and impact investment.

The Detail

Building capacity within GoPNG is critical if it is really going to lever international climate finance and impact investing. Currently, it is surviving on a lean budget and has limited personnel to drive home these opportunities. As noted above, there have been numerous proposals and recommendations (through several consultancies, including this one) to tap into and utilise international climate finance investment. At this point in time, the CCDA (and a several other agencies, such as DNPM) act as the central point for considering these proposals while also trying to solve significant technical and policy alignment issues (as noted in the Biennial Update Report)[2] around MRV, governance and intuitional frameworks that will then allow REDD+ projects to be more readily undertaken. Meanwhile, the CCDA also has the enviable task of screening REDD+ and other project proposals, while maintaining

engagement with civil society and external partners - all while trying to compete for funding from GoPNG's declining budgets, for a cause (and seemingly elusive opportunity) that many public servants and ministers in other agencies do not understand/do not see merit in.

This low institutional capacity and lack of whole-of-government coordination creates challenges both between different levels and across different parts of government. It also means PNG will often miss out on harnessing external financing opportunities to fund sustainable agriculture and forestry projects (including REDD+) – simply, because it does not have the time and resources to mount an effective response.

Many PNG authorities including CCDA have legal provisions enabling them to raise revenues (e.g. a 7% administration fee on climate finance), but few appear to be harnessing these due to capacity constraints and the initial planning and investment necessary to deploy such initiatives - a wicked problem, in that not enough effort has been focused on bringing finance to these agencies as these agencies have had their hands full with other priorities.

The 2018 climate finance options report by DNPM provides several internal and external ways to finance and build capacity within the CCDA and other agencies, these include:

- **Climate administration fee:** "The *Climate Change Management Act 2015* states that all funds received for climate change activities, nationally or internationally shall be charged 7% of the total funding to be paid to the Climate Change Resilience and Green Growth Fund as Climate Administration Fee". The impact on such a fee on disincentivising climate finance flows has not been assessed however.
- **Departure tax green fee:** Requiring a "green fee" be paid by non-PNG nationals as part of departure tax - this works on a "user pays" principle, which can provide a regular stream of funding to support the national climate change efforts in PNG. This idea was based on Palau's green fee, which is $50 per international departure and which is used as "a source of economic subsidy to further the cause of conservation programs, including, but not limited to job creation, institutional capacity building, capacity building to train and build the workforce for effective conservation management programs, public awareness, surveillance, enforcement programs and biological monitoring programs".
- **Environment and Climate Adaptation Levy:** Like for the policy in Fiji, an environment and climate adoption levy would be applicable to tourists that come for the luxury of the accommodations and the natural beauty and recreational opportunities in PNG to support environmental protection programmes. The Fiji levy is administered by the Fiji Revenue and Customs Service and collected by prescribed service providers (e.g. hotels) at the rate of 10% on the 'turnover' (i.e. the total charges for prescribed services billed to consumers. The proceeds are used to fund climate adaptation projects in communities throughout Fiji. The levy is legislated through the Environment and Climate Adaptation Levy (ECAL) Act 2017.
- **Plastic bag levy:** According to the DNPM 2018 report "The application of a plastic bag levy in Fiji has witnessed a reduction in the use of plastic bags, with the view of a complete ban on plastic bags in Fiji by the year 2020. The plastic bag Levy is also legislated through the Environment and Climate Adaptation Levy (ECAL) Act. It requires all businesses to charge a levy of 20 cents per plastic bag provided, where such businesses utilize a cash register which is a Point of Sale (POS) Invoicing Device into which a cashier enters data for a transaction. The levy is applicable on all plastic bags with handles and are provided by the businesses for carrying or transportation of goods. The Plastic Bag Levy is paid by the consumer based on their choice but collected by the business who will then remit it to the Fiji Revenue & Customs Service. The levy is not imposed on a manufacturer, wholesaler or retailer of plastic bags. Businesses must ensure that the levy on plastic bag is shown clearly and separately on the receipt".

- **Environment Disposal Fee:** As currently being implemented in the Federated States of Micronesia, an environment disposal fee of $100 is imposed on each shipping container that arrives into the country as well as $50 for each imported car - this levy on imported cars reflects the draft concept by CCDA for NEC consideration.
- **Recycling Fee:** A recycling fee of $0.10 is imposed on all can drinks in the Federated States of Micronesia (and in many other parts of the world) - as a source of subsidy to support recycling efforts at the national level in PNG.

➢ Step 3 - Develop a coordinated strategy for tapping into international climate finance flows, and further down the track, impact investment

In Summary

- The development of the RFIP provides an opportunity to undertake whole-of-government consultation with GoPNG's various agencies, with an objective being to raise awareness for the significant amounts of funding available for climate mitigation and adaptation projects, and later down the track, how impact investing may assist in scaling up these projects and associated industries.
- It would also step out the various instruments and approaches that could be used to de-risk investment in PNG. A whole-of-government endorsement of the RFIP (e.g. via the NEC) would provide a powerful signal to impact investors that PNG is serious about developing sustainable agriculture and forestry projects that have REDD+ benefits, and the channels of responsibility within GoPNG for going forward.

The Detail

A key barrier is confusion and too much information. Over the last decade, there have been many ideas on how to best tap into international climate finance flows. Some of these have been enacted (often by different GoPNG departments), whereas many just remain ideas. Led through the NEC, GoPNG needs to commit to a *single cohesive investment roadmap*, informed by the most nationally appropriate recommendations of the climate finance studies that have been summarised in this document (see above). This would step out the process and key steps e.g. establishment of governance systems (next year), then environmental finance trust fund (see below) following that.

As noted by the DNPM report, GoPNG should develop an NDC Implementation Roadmap plan to define roles of different agencies in implementing PNG's NDC. Fiji's NDC Implementation Roadmap is a good example. UNDP with the assistance of GoPNG and other organisations is developing the RFIP, which will essentially be a whole-of-government NDC implementation document for REDD+. The NRS and RFIP document provide positive steps towards a more coherent policy approach towards forest and REDD+. Continuing to strengthen this process through cross-sector coordination and addressing key issues relating to agricultural concessions, processes for land clearing and future timber production and levels of processing would provide a strong basis for further development. Capacity building and developing a shared-understanding (including with the community) should be a core component of this process, to ensure all GoPNG agencies are aware of this document, which is then endorsed via the NEC.

Critically, this document must step out a 10-year timeline for putting in place the building blocks to improve the impact investment environment, both those specifically related to sustainable agriculture and forestry industries and those for the broader economy.

➢ Step 4 - Identify and assist in the development of a pipeline of bankable projects

In Summary

- Currently, there is no publicly available pipeline of bankable and non-bankable REDD+ and sustainable agriculture and forestry projects for PNG.
- Developing a strong pipeline of bankable and socially inclusive and environmentally sustainable land management projects to attract climate finance and impact investment will be a challenge for PNG. There are several ways GoPNG could work with its multilateral partners to assist in building a pipeline of projects.
- The first way is to help identify potential projects across the country, in consultation with regional community representatives, short-list these based on the associated risks (e.g. likely community need/acceptance/willingness, ease of access, available topographic and natural resource data, priority areas for investment and where social and environmental co-benefits exist) and opportunities (e.g. scale), and then engage the services of a third-party intermediatary/expert to assess the merits of the "top-ten" options (for example). Such a list could then be made available on request to interested parties or used consistently amongst GoPNG agencies when tendering for climate finance.
- Another way is through establishing standardised protocols for PNG, for example, a sustainable land management investment orientated due diligence screening checklist for evaluating projects. Such procedures help investors quickly remove unfeasible projects from their pipelines, so they can allocate more resources to evaluate those with more promise. Project templates, such as Encourage Capital's blueprints for investing in sustainable fisheries, the Coalition for Private Investment in Conservation's (CPIC) investment blueprints and California's standardised conservation covenant template, can also help accelerate the process of developing and structuring projects while helping investors avoid high-risk projects. These types of procedures and templates are common in carbon markets around the world, e.g. the carbon offset sector where Emissions Reduction Purchase Agreements (ERPAs) have made it easier and cheaper for private sector investors to purchase carbon offsets.
- As part of standardising climate finance investment protocols and scaling-up sustainable land management projects, project developers will also need to create new investment models that will generate future opportunities. As such, entrepreneurs working on novel approaches to climate financing, tied to impact investing, often need upfront support to operationalise projects. Financial support, market development and capacity building (e.g. networks, training, technical assistance) are important at this stage of development and present a vital role for GoPNG and PNG-based NGOs (e.g. TNC) to work with potential donors and investors to establish, for example, innovation incubators and incentives to aid start-ups and the formation of networks. For example, in Australia the Impact Investment Ready Growth Grant (provided by Impact Investing Australia). Such efforts can play a critical part in this regard whereby potential impact investors connect (see above on the importance of developing a pipeline) to sustainable land management projects that suit their risk appetite and their expectations for environmental impact and financial returns. Business incubators have been shown to be an effective proving ground for new financing ideas such as environmental impact bonds and insurance products which serve to mitigate risk.

The Detail

Identifying a pipeline of environmental and socially sustainable and bankable projects is critical if PNG is to attract international climate finance and impact investment at scale.

One of the key challenges facing climate finance deployment for REDD+ in the Pacific, including PNG, is identifying and assessing both pilot and large-scale projects. There are many reasons for this, including the current lack of capacity within the CCDA and other agencies to assess projects, a lack of understanding amongst landholders, security concerns around visiting certain areas of the country where a project may be suitable, etc.

Perhaps the single most challenging aspect of accessing both climate finance and impact investing opportunities is to identify climate mitigation and adaptation projects that can generate a financial return. While grants can provide for pilot scale projects where the ROI is not guaranteed, many projects undergoing scale-up - including REDD+, sustainable agriculture and forestry – are currently unable to generate a financial return, as their viable is exclusively tied to a subdued carbon offset price. Such, projects also have typically high transaction costs. While there are some exceptions, and the evidence base continues to build linking sustainable agriculture with improved land productivity, the fact that REDD+ is generally not a profit-making enterprise should not be overlooked. Where a financial return is identified, there are four main challenges to attracting private-sector investment in conservation and sustainable land management.

The first challenge is to generate an acceptable cashflow once the project commences. In the case of sustainable agriculture and forestry, many projects only start generating cashflows after several years of investment i.e. once commodities become available for sale (e.g. cocoa, carbon). Other projects produce benefits that are difficult to monetize e.g. the non-market economic gains from conserving biodiversity, boosting the incomes of local communities or mitigating risk associated with future losses. For example, restoring and conserving tidal marsh, barrier islands and shellfish reefs can reduce storm damage being done to coastal infrastructure. An added complexity is that when multiple parties benefit from a restoration project it can be difficult to get some parties to provide upfront capital.[3]

Critically, sustainable land management focused investments are often relatively small compared to other private investment opportunities (e.g. energy), and therefore create a significant disincentive for fund managers to invest. Face-to-face interviews with several of large multinational fund managers (including several operating in the Pacific) suggest that deals need to be in the realm of at least $50 million to $100 million to be worth considering.[4] This is partly because transaction costs tend to cut significantly into small-scale investment opportunities. Associated with this challenge is that sustainable land management revenue streams are often considered less competitive compared to competing market opportunities (e.g. the conversion of forests or grassland for agriculture), at least in the short-to-medium term.

The second challenge is the unpredictability and inherent complexity of ecological systems - it can be problematic to predict conservation outcomes from managing an ecological system in a particular way, even with robust scientific knowledge. This is important as ecological systems impose changeability for business activities, such as food and fibre production. Subsequently, cash flows from sustainable land management projects are often uncertain.

A third challenge is that sustainable land management projects are complex, particularly with regards to governance, marketability and defining objectives, often requiring expertise in ecology, economics, project management, law and public policy. This can be a barrier as most sustainable land management projects depend on defined uses for land and water – scarce natural resources that may be used in a variety of ways. Promoting environmentally beneficial uses of resources can be highly political and unpopular for government and may result in high opportunity costs through excluding other socially beneficial uses for that land, and therefore, lower profits compared to other land uses (e.g. mining).

A fourth challenge is that sustainable land management projects may also generate enhanced risks, such as potential conflicts of interest between multiple stakeholder groups, and regulatory risk. The bottom line is, investors do not like uncertainty, especially where small projects are concerned; sustainable land management projects inherently create a lot of risk in this respect. However, there are certain ways that this uncertainty can be managed, which will be discussed in this section. Also, project developers and investors can utilise various tools (see below) to improve a project's expected risk-adjusted returns. Management and operational risks, for instance, can be mitigated by assembling a team with all the necessary expertise in science, economics, business, policy, cultural affairs, and other areas.

➢ Step 5 - Mitigate risk to expand international climate finance and impact investment flows

In Summary

- PNG's Climate Change Management Act 2015 articulates the creation of a "Climate Change Resilience and Green Growth Fund" and requested the Minister of Finance to combine (within four months after the Act was enacted) individual trust accounts established under Section 15 of the Public Financial Management Act 1995 into the new Climate Change Resilience and Green Growth Fund. The Climate Change Resilience and Green Growth Fund is yet to be established.
- Numerous GoPNG and external reports have recommended the establishment of an environmental trust fund in some form. In many cases, international public-sector finance (such as provided by the World Bank and GCF) would be best used if it leveraged against private sector funding. One of the most transparent, efficient and politically smart ways of doing this is through the establishment of a national environmental trust fund. Whether this is fund is called a "Climate Change Resilience and Green Growth Fund" or a "REDD+ National Climate Change Trust Fund Account", or something else, environmental trust funds have been used to great effect throughout the world to pool money into one pot.
- The independent facility would not only operate a trust, but also work to promote new forms of environmental markets (e.g. biodiversity) and financial instruments, such as green bonds. Through the proposed environmental trust fund, GoPNG will be able to more readily leverage multilateral and bilateral finance and private sector finance as part of a PPP due to increased transparency and robust benefit sharing systems, and through demonstrating that GoPNG has "skin in the game" in the form of money in the fund – therefore sharing project risk. Credit enhancement tools (e.g. CFLC facilities and loan guarantees) will play a critical role in de-risking REDD+, sustainable agriculture and forestry projects in PNG. This can be applied at both the project and (environmental trust) fund levels.
- Expertise on structuring and implementing such facilities can be drawn from specialist units within several multilateral development partners e.g. ADB, World Bank.
- The ongoing provision of technical assistance is critical to making more significant climate finance and impact investing deals.

The Detail

As noted above, PNG is currently one of the least attractive investment destinations in the Pacific, particularly for new businesses wanting to establish themselves and with regards to enforcing contracts. In combination with stronger systems of governance (see above), GoPNG must work to remove/lessen barriers to entry to make it easier to for invest climate finance supported activities. This section provides for several options how this can be achieved at the project and fund levels.

Blended finance

Blended finance uses a mix of public, philanthropic and/or private investment. Blended finance can occur at both the fund and project levels and can be used to mobilize private capital and increase finance for private sector activities[5]. The blended finance market is currently worth approximately $50 billion globally and is expected to double within 5 years and be dominated by small-scale funds of around $100 million.[6] Numerous examples of blended finance have been provided in this report e.g. funds raised by Althelia Climate Funds.

Blended finance can be used as a gateway finance mechanism when wanting to create a mainstream shift from depending upon government entities, philanthropists and other grant giving organisations, to gradually being fully funded by private investors. In becoming self-sustaining through this investment, projects eliminate the risk of relying on ongoing philanthropic and public funding, the receipt of which may not be certain year-to-year. There will be some types of projects that will always rely on blended finance, but even partial private support of a project that was previously entirely supported by philanthropic or public funding will free up that philanthropic or public funding for other worthy projects.

Blended finance can also be an effective solution for mitigating risk and accelerating the development of sustainable agriculture and forestry projects and correcting existing market failures.[7] A significant issue for these project types is that the risk to return ratio is often not seen as favourable by mainstream investors, especially when a lack of environmental accounting and environmental markets make generating or calculating a return particularly difficult.[5] Critically, blended finance can also aid in de-risking these projects through public funding and philanthropic giving supporting early stage ventures; potentially through new government-initiated institutions.

Below market debt and equity grants allow project developers to carve out investment tranches with lower risk-return profiles, which can then be funded by capital from public or philanthropic sources. This separation allows other tranches to have risk-return profiles that fit private investors' expectations, making it possible to raise funding for projects whose overall risk-return profiles might otherwise hold little appeal.

Intermediaries

Structuring blended finance deals can be complicated. Financial intermediaries and fund managers can play a critical role in structuring and brokering deals for a specific conservation project, and as part of a larger portfolio of managed funds. This includes blended approaches that may interest investors seeking financial returns in addition to conservation outcomes. Trained financial professionals can also connect project developers with investors who are qualified to evaluate the risks and returns associated with complicated investments structures often associated with conservation finance projects.

Intermediaries can help build capacity to identify and source bankable projects so that smaller value projects can be aggregated into commercial / feasible investments. For instance, firms such Althelia Climate Funds, The Nature Conservancy and Baker McKenzie have successfully aggregated climate projects, making it possible for landholders to access finance from various multilateral and bilateral funding sources where individually their projects would be of insufficient scale to do so. In this way, intermediaries could also play a critical role in building scale in the broader conservation and sustainable land management sector.

Environmental Trust Funds

Government-run environmental trust funds are independent legal entities and investment vehicles designed to help de-risk, mobilize, blend, and oversee the collection and allocation of financial resources for environmental purposes. There are at least 80 environmental trust funds established

around the globe. Environmental trust funds are internationally recognized for their role in channelling global funds to support national priorities, including REDD+.

Funding for environmental trust funds comes from a variety of sources, including environmental levies and surcharges, higher taxes and philanthropic donations. Environmental trust funds can be set up at a local, regional, state or national level, and the sources for those funds vary accordingly. Though structures and investment strategies vary between trusts around the world, most are effectively grant-making institutions. Importantly, for PNG and other developing countries, setting-up an independently run environmental trust as a "ring-fenced" funding vehicle is very important to provide assurance to co-funders and investors that the money will not be used for another purpose for which it was originally intended.

Environmental trust funds have a defined: legal (e.g. special purpose vehicle under law), governance (e.g. board) and financial structure (e.g. endowment fund, revolving fund, sinking fund etc); capitalisation and resource mobilisation strategy (i.e. where funding comes from (e.g. government appropriations, sale of carbon offsets, philanthropy etc); and, fund utilization method (e.g. grant delivery and portfolio management). For example, Coast Funds manages a permanent endowment fund of about $42 million, with the income generated from the fund being granted to Canadian First Nations groups to undertake conservation activities in the Great Bear Rainforest.

Regarding scalability, the potential financing that a typical environmental trust fund could raise is in the realm of between 5 million and 100 million. There are however notable exceptions. For example: the Brazilian environmental trust fund 'Fumbio' raised over $500 million in capital; Thailand's Energy Conservation Promotion Fund, a revolving fund financed through levies on petroleum, has an annual income of approximately $225 million; and, the Madagascar Biodiversity Fund managed to capitalise over $50 million in finance, despite the country's volatile security and political situation. In the US, the Massachusetts Environmental Trust resource mobilisation strategy relies on 30,000 local citizens to fund it through state taxes, with a top-up provided through Natural Resource Damage Assessment penalties going into the trust.

The 2018 DNPM report recommends that government seriously consider the establishment of a national "Climate Change Resilience and Green Growth Fund" (CCRGGF), which could include the following functions:

- Building capacity in the CCDA and other agencies who have the responsibility of leading on leveraging international climate finance flows;
- Small grants program for mitigation and adaptation projects in regional communities;
- Capacity development support (e.g. scholarships) and technology innovation;
- Support participation in the UNFCCC COP negotiations; and,
- Promoting private sector (including impact investing) and civil society engagement in climate change activities and projects in PNG.

As listed above, potential domestic revenue sources to capitalize a national sustainable funding mechanism include Climate Administration Fee, Green Fee, Environment and Climate Adaptation Levy, Plastic Bag Levy, Environment Disposal Fee, Recycling Fee, Green Bonds, and Matching contribution from the GoPNG (via an annual budget allocation). The 2018 DNPM report goes on to articulate the process for establishing the CCRGGF, as follows:

1. "The Government to endorse the establishment of a dedicated national Climate Change Resilience and Green Growth Fund.
2. Agree that the functions of fund management and disbursement be undertaken by the Department of Finance to ensure funds are administered and managed in accordance with the

Public Money Management Regularization Act 2017 and the Public Financial Management Act 1995.

3. Government to commit to providing counter-funding from annual budget allocation to capitalize and the proposed Climate Change Resilience and Green Growth Fund.
4. Endorse that the utilisation of funds be overseen by a multi-agency board, through the proposed National Steering Committee on Climate Finance co-chaired by CCDA and DNPM, and for CCDA to serve the secretariat arrangements for the Fund.
5. Consider a separate Bill to establish the Fund and its governance arrangements, or appropriate amendments to the existing Climate Change Management Act 2015 that will be reviewed soon.
6. NEC to task the National Steering Committee on Climate Finance and CCDA to consult with relevant stakeholders on the proposed options for capitalizing the Fund and provide detailed concepts and recommendations to NEC for consideration".

Examples of environmental trust funds in the Asia Pacific

The Tonga Climate Change Fund (TCCF) was approved in 2012. Its objective is to mainstream climate resilience into government planning and establishes a financing mechanism to support community-based climate change mitigation/adaptation responsive investments. The establishment of the TCCF involved the use of an ADB Grant of $5 million as a capital investment, through its Climate Investment Fund. The TCCF was established as two separate bank accounts, these being the $4 million Endowment Fund and $1 million Operational Imprest Account. The disbursement of funds is governed by a TCCF Board, administered by the Joint National Action Plan Secretariat and a Program Management Unit, the latter which has a climate change coordinator assigned to manage the TCCF. The actual disbursement of funds is undertaken by the Ministry of Finance and National Planning to ensure funds are administered and managed in accordance with the PFM Act 2002. Another example is the Indonesia Climate Change Trust Fund[8], which is administered by Indonesia's National Development Planning Agency with UNDP serving as the interim trustee. This fund includes a focus area on REDD+ and the restoration of carbon-rich peatlands around Indonesia, including in the Central Kalimantan region.

Public-private partnerships

Public-private partnerships (PPPs) are a long-term agreement or contract established between a government agency and private-sector entity that can be used to finance, build and operate projects, including sustainable land management projects.[9] [10] PPPs can be used for various initiatives and range from simple to complex management or outcome-based contracts.[11] Typically, it is the private partner(s) that finances and delivers the public services, with the private partner being compensated through unitary payments by the public sector or user charges.[12] A well-known example of a PPP is a private construction company partnering with a government agency to construct a new road; with the private company being compensated through road toll charges.[13]

An advantage of PPPs in relation to conservation is that they provide the private sector with the climate finance expertise of the public sector (i.e. multilateral development partners and GoPNG who are the predominant funders of climate mitigation and adaptation currently), while allowing the private sector to provide improvements to environmentally related goods and services without using public financial capital.[14] Through mobilising private finance, a reduction in the dependency of public financing will occur over time. For PPPs to be used in a sustainable land management context, the inclusion of non-government and non-profit organisations focused on sustainability and conservation is vital to ensure successful outcomes are produced by the partnership.[15]

Several PPP examples for climate finance have been provided by this report e.g. the Althelia projects in Peru. There are also numerous examples of PPPs in the Pacific. For example, UNDP and the ADB are both Accredited International Entities under the GCF with strong connections PNG and other South Pacific countries. Both these multilateral development partners and bilateral development partners are teaming up to leverage each other's strengths to support Pacific Island Country governments tap into climate finance at scale. For example, New Zealand provided practical support to access the GCF via a technical assistance initiative which made available technical specialists on flood management, drainage and water to the Marshall Islands, PNG, Tonga and Samoa – in partnership with UNDP, a 'fit for purpose' proposal was put to GCF which included an approved $65 million for integrated flood management project in Samoa.

Credit enhancement tools

In addition to environmental trust funds and PPPs, there are a range of credit enhancement tools which help to reduce the risk of doing business in PNG and enhance the risk-return profile at the project-level. As discussed extensively in this report, impact investors are often motivated by social and/or environmental outcomes or through wanting to demonstrate the commercial viability of investing into a new market. These credit enhancement tools include:

- **Catalytic first-loss capital (CFCL) facilities** – A credit enhancement tool which helps to improve the recipient's risk-return profile by identifying a provider who will bear the first loss e.g. US Aid providing a CFLC facility for the Althelia Climate Fund. The CFLC facility enables the participation of investors that would otherwise not be able to participate. It includes instruments like grants, equity, and subordinated debt.
- **Credit ratings** - A formal evaluation of an entity's credit history and ability to pay back a loan. Currently, PNG's low national credit rating is a barrier to investment. However, this rating can be improved at the project level through carefully structuring deals to include CFCL facilities, loan guarantees etc (as listed here).
- **Investment disclosure** - A related, but separate development to credit ratings is the rise of voluntary investment sustainability reporting and disclosure, such as through CDP. CDP is a global network of policy makers and investors who represent over $100 trillion in assets. Each year CDP asks companies, cities, states and regions around the world for data on their environmental performance, and strategic business risks and opportunities (e.g. related to climate change), to use this data and insights to make better-informed investment decisions. For instance, the responses may alert them to companies which may be degrading natural capital in their supply chains – which would possibly constitute a riskier investment. Why is this important for PNG? Essentially, if GoPNG decides to set policies and enforcement frameworks that allow for the over-clearing of native forest for palm oil (etc), then PNG is likely to be an unattractive investment destination for impact investors and buyers whom will subsequently look to other countries for more sustainable palm oil.
- **Letter of credit** - A letter from a bank, foundation, or other entity that guarantees payment on behalf of a borrower up to a stated amount for a specific time - an incredibly important risk management tool that PNG may be able to leverage from several multilateral development partners e.g. ADB;
- **Loan guarantee -** An agreement where the provider (e.g. government) takes responsibility for paying back a loan if the borrower cannot – Like letters of credit, loan guarantees from multilateral development partners are an invaluable risk mitigation instrument that not only helps to cover perceived government-related risks, but also facilitates access to private sources of finance.[16] Project-based loan guarantees are issued for the benefit of specific investment projects in countries seeking to attract private investment, whereas, policy-based loan guarantees support

a World Bank Group member country's policy and institutional actions through general balance-of-payments support. The IFC, the private-sector arm of the World Bank Group, issues long-term loans, equity, structured and securitized products, and advisory and risk mitigation services to private enterprises in developing and transition countries;

- **Over-collateralization -** A process where a borrower puts up more collateral than is necessary to secure financing. These assets are used to absorb losses if cash repayment falls through;
- **Insurance mechanisms** - Any approach where the cost of potential loss is transferred to another entity in exchange for monetary compensation, or the premium;
- **Buyer-of-last-resort mechanisms** - An approach where an entity agrees to purchase the credits or benefits of a project, often at a minimum price, if no other buyer can be identified; and,
- **Reserve accounts** - Like a savings account. They are often provided in the form of grants and serve as a first-stop for any losses incurred.

Technical assistance

The provision of technical assistance should not be underestimated – it has played – and continues to play – a key role in leveraging climate finance. Presently, most climate finance to the South Pacific is channelled through accredited multilateral development partners and intermediaries, which provide much-needed technical support to develop and implement high-quality climate-related projects in a context of low capacity. Pacific SIDS have acknowledged the benefit gained from technical assistance provided by a range of partners, such as the ADB, the Secretariat of the Pacific Regional Environment Programme (SPREP), UNDP and the World Bank Group.

Scaling-up investment opportunities

Down the track, the structuring of larger investment opportunities could assist fund managers, for instance, tap into private capital while spreading out transaction costs. The aggregation, or "bundling" of similar but relatively small projects (very common in Pacific countries) into a larger investment product, while using standardised protocols and templates, can help bring transaction costs down substantially. Aggregation has been a common feature of in many carbon offset markets around the world (e.g. CDM's programme of activities). The proposed environmental trust fund could play a key role in this process. for example, the Forestland Group in the US set up several trusts to invest in 1.5 million hectares of sustainable land management projects in 23 US states and 3 other countries South American countries. There is potential for fund managers to aggregate different sized but geographically and return-related project types into a single diversified product e.g. forestry, eco-tourism, and agriculture. Another way is to manage the scalability challenge is to develop investment products with existing and commonly used structures. For example, a private equity–focused conservation fund could direct $100 million, for instance, toward a portfolio of projects in mature markets such as sustainable forestry and ecotourism. Government investment institutions (including in GoPNG) could also issue green bonds covering a large area of ecologically sensitive land, then use the proceeds to finance conservation outcomes and repay the debt with revenues from park entrance fees and other visitor related sources.

➢ Step 6 - Embrace carbon as a commodity, promote PNG as an exporter of sustainable products

In Summary

- Taking these factors and the aforementioned discussion on de-risking investment into account, PNG can position and promote itself to more easily attract significant more amounts of climate finance, and progressively, tap into the private-sector impact investment market.
- Backed by a comprehensive economic analysis provided by key strategy documents, for example the REDD+ Finance & Investment Plan (RFIP), PNG's trade promotion body (the IPA) should be educated and encouraged to work with other institutions (e.g. PNGCCI) to show-case PNG's sustainable land management investment opportunities to the world.

The Detail

Many impact investors are unaware of opportunities within PNG and may even have perceptions of low-quality products. Developing and promoting high-quality and sustainable products and commodities across all areas (carbon, timber, coffee, cocoa, biodiversity) that include strong co-benefits will be critical to increasing investor awareness, confidence and ultimately attracting FDI for sustainable agriculture and forestry projects in PNG.

Foreign investment in PNG is regulated by the Investment Promotion Act of 1992, which created the Investment Promotion Authority (IPA) and set outs regulations for foreign investors operating in the country. The act stipulates that the IPA holds primary responsibility for approving new non-extractive investment applications and responsibility for providing (amongst other mechanisms) a dispute resolution process between the government and foreign investors at the International Centre for Settlement of Investment Disputes. The IPA also provides/promotes several incentives that could be useful for de-risking and attracting FDI to sustainable agriculture and forestry projects in PNG. These include, for example, the Multilateral Investment Guarantee Agency's (MIGA) guarantees to foreign investors against losses caused by non-commercial risks; and, advisory and consultative services to member countries to assist them in creating a responsive investment climate and information base to guide and encourage flow of capital.

Notably, PNG has also entered into investment protection agreements with Australia and Malaysia. The IPA could take a lead on also promoting existing tax incentives (such as GoPNG's Rural Development Incentive and Double Deduction for Export market Development Costs) to new sustainable land management focused start-up businesses and projects – providing an important signal that PNG is fully supportive of developing industries that help conserve its natural capital and that are socially inclusive.

The PNG Chamber of Commerce and Industry (PNGCCI), with an objective to "to serve as the voice of PNG business and be an independent forum for the development of a consensus among the business community on matters of national concern", is another important channel for which to engage and help promote PNG's sustainability strengths and help attract FDI. When it is ready to do so, PNG's Investment Conference (to take place in Sydney, Australia in 2019) would also be the ideal forum to promote PNG's climate finance and impact investing opportunities.

Off the back of the RFIP, a sustainable impact investment prospectus could be developed by GoPNG (similar to the Queensland Government's investment prospectus) to help promote such opportunities in PNG to international parties.

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Document History

Final version, Issue date: 10/05/2019, Description: Final version, as per discussion with Team Leader
Issued to: UNDP (PNG) Project Management

Daft version no. 01, Issue date: 26/04/2019, Description: Draft for comment
Issued to: UNDP (PNG) Project Management Unit

Contents

Acronyms & Abbreviations

ADB	Asia Development Bank
APEC	Asia Pacific Economic Cooperation
AUM	Assets Under Management
Blended finance	Multiple funding sources (government, private, philanthropic) working together to make a project a success
CCDA	Climate Change Development Authority
CEPA	Conservation and Environmental Protection Authority
CFLC	Catalytic First Loss Capital
Climate finance	Refers to local, national or transnational financing—drawn from public, private and alternative sources of financing—that seeks to support mitigation and adaptation actions that will address climate change
CORSIA	Carbon Offset Reduction Scheme for International Aviation
CSO	Civil Society Organisation
CSR	Corporate Social Responsibility
DNPM	Department of National Planning and Monitoring
Debt	Debt is an amount of money borrowed by one party from another
DEC	Department of Environment and Conservation
DFAT	Department of Foreign Affairs and Trade (of the Government of Australia)
Equity	Typically referred to as shareholder equity, represents the amount of money that would be returned to a company's or project's shareholders if all the assets were liquidated and all of the debt was paid off
EIB	European Investment Bank
FCPF	Forest Carbon Partnership Facility
FDI	Foreign Direct Investment
PNGFA	PNG Forest Authority
FSC	Forest Stewardship Council
FTA	Free Trade Agreement
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEF	Global Environment Facility
GGGI	Global Green Growth Institute
GoPNG	Government of PNG
Green Bonds	A fixed-income investment, where an investor lends money to an entity for project that results in positive environmental outcomes, which borrows the funds for an agreed period at a variable or fixed interest rate
GLP	Green Loan Principles
ICAO	International Civil Aviation Authority

IFADA	International Fund for Agriculture Development Adaptation (Smallholder Ag. Programme)
IFC	International Finance Corporation
Impact Investing	Investments that combine financial returns with social and/or environmental benefits
LULUCF	Land Use, Land Use Change and Forestry
NGO	Non-Governmental Organisation
KPIs	Key Performance Indicators
MPA	Marine Protected Area
MTDP	Mid Term Development Plan
NCCB	National Climate Change Board
NEC	National Executive Council
NRS	National REDD+ Strategy
NMM	New Market Mechanism
ODA	Official Development Assistance
OPEC	Organization of the Petroleum Exporting Countries
PA	Protected Area
PNG	Papua New Guinea
Real Assets	Physical assets that have value due to their properties and substance e.g. precious metals, real estate, agricultural and forestry lands and water rights
REDD+	Reducing Emissions from Deforestation and forest Degradation +
RFIP	REDD+ Finance and Investment Plan
ROI	Return on Investment
RSPO	Roundtable for Sustainable Palm Oil
SABL	Special Agriculture and Business Leases
SDG	Sustainable Development Goals
tCO2	Tonnes of Carbon Dioxide Equivalent
TNC	The Nature Conservancy
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCU	Verified Carbon Unit
VER	Verified Emissions Reduction
$	All $ are US dollars equivalent

1.0 Background

In the face of rapid global change, PNG is a country at economic, social, environmental and geopolitical cross-roads which requires careful decision-making to balance accordingly.

There is a well-documented need to ramp-up economic development and improve the livelihoods of its people. PNG's economy is largely supported by four sectors[17]: 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. Agriculture, forestry and fishing combined are the largest sources of employment domestically, providing jobs to around 20% of the working population.[18] Moreover, these sectors maintain a strong cultural connection with the citizens of PNG, whom have developed the necessary skills and knowledge to work the land over the course of many decades. Given this, the urgent need to raise the standard of living (PNG ranked 154 out of 187 countries on the Human Development Index in 2016[19]) and meet the growing international demand for timber, food (which is set to double by 2050)[20] and other natural-resource based commodities, unsurprisingly, the scaling-up of these industries is a priority for the Government of PNG (GoPNG).

However, the decisions of GoPNG as to what policies, programmes and planning regimes will be pursued to scale-up these industries will impact the country's future prosperity for decades to come. More than three quarters (28 million hectares) of PNG's carbon rich and biodiverse forests remain undisturbed – a proportionately high level compared to world standards, and a strategic and sustainable investment opportunity if GoPNG plays its cards right. While some of this land will be required to achieve economic growth through the expansion of forestry and agriculture, unsustainable land use policies and lack of enforcement will put at risk the "natural capital" advantage that PNG currently enjoys – it is one of the few countries around that world that has relatively intact and healthy ecosystems that provide important benefits to its citizens. PNG's natural capital includes not only its forests, but its rich and fertile soils (suitable for growing food and fibre), its rivers and streams, its native plant and wildlife, and its marine ecosystems and fisheries.

PNG's natural capital is already under threat. The commercial logging sector, the largest driver of forest emissions, is planning to expand.[21] There are currently over 8.6m hectares of forest under concession in PNG, with most timber permits not due to expire until 2050.[22] A further 8.4m ha have been identified for potential future development. 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[23] which see an estimated additional 1.3 million ha of land converted to cropland. Subsistence agriculture covers an area of 3.2 million ha in PNG, with production closely linked to domestic consumption. With population increasing rapidly in PNG (circa 3.1% per annum)[24], and per capita consumption also rising, deforestation due to family agriculture is also likely to increase.

The clearing and degradation of native forests to scale-up forestry and commercial and family agriculture does not just impact the natural environment and biodiversity. Soil erosion and runoff associated with land clearing, and chemical (pesticides) and nitrogen (fertiliser) pollution associated with increased agriculture can then readily enter streams, then flow into rivers, and finally into the sea – this pollution will damage PNG's marine ecosystems (e.g. coral reefs) and therefore commercial and subsistence fisheries. The clearing of coastal wetlands and mangrove forests (fish habit) can also impact fisheries and expose coastal communities and land-based industry (e.g. ports) to sea-level rise and storm surge events – both of which are increasing due to climate change. Keeping these coastal ecosystems intact can buffer against these negative impacts. Moreover, sustainable land management practices could aid in enhancing natural capital derived economic outputs. For example, the National Fisheries Authority (NFA) estimates PNG's 350 to K400 million market value of fish catch could be increased significantly through better land and sea management and development programs.

The other consequence of degrading PNG's natural capital is to increase PNG's greenhouse (GHG) emissions. PNGs forests store a significant amount of carbon dioxide (CO2) - The clearance of all 4 million hectares of Special Agriculture Business License (SABL) designated areas would result in emissions of 1.2 GtCO2e, equivalent to around 30 years of emissions at current levels[25]; and, if the expansion of the agriculture sectors were to take place as outlined above, PNG's GHG emissions would conservatively increase by an additional 220 million tCO_2 over a 15-year period - a 50% increase in current emissions from commercial agriculture.[26]

While GoPNG considers the direction in which it will to drive the country's future, globally, governments in partnership with the private sector are focusing their attention on investing substantial amounts of money in business models that do not degrade natural capital. This rapid change in investor sentiment is leading to a clear preference for forestry and agricultural businesses and projects that do not degrade a country's natural resource base – but instead - can demonstrate clear sustainability benefits (e.g. minimising impact on biodiversity, dealing with waste, managing wildfires and pests, reducing the use of pesticides, fungicides and herbicides, and improving soil health). Critically, this private sector "impact investment" is being combined with international public-sector climate finance flows which act to de-risk these new business models that are centred on sustainability.

To its credit, GoPNG has shown leadership and commitment to contribute to the reduction of global GHG emissions by transitioning to a low carbon economy – as has been entrenched in its relevant climate change legislation (*Climate Change Management Act* 2015 and *Paris Agreement Act 2016*), and in policies such as the *National Climate-Compatible Development Management Policy 2014* and the National *REDD+ Strategy* (NRS). GoPNG has also enshrined the concept of "sustainable land development" in many of its other national plans and targets, and as a focus for some of its most important government committees. For example, the recent Medium-Term Development Plan (MTDP) reiterated the government's commitments to increasing the area under conservation and reducing rates of forest loss while continuing to support responsible and sustainable development particularly in rural areas.

Unfortunately, due to several key barriers, much of this high-level commitment has failed thus far to increase the share of international public-sector climate finance and private sector impact investment flowing into PNG. Addressing these barriers now is critical if PNG is to position itself as an attractive climate finance and impact investment destination that has balanced the needs of developing a stronger economy while maintaining a healthy environment for its people.

2.0 Purpose

This strategic assessment report reviews public and private financing sources to support NRS implementation. This includes existing and potential development partner (bilateral) climate funds, recent developments under the UNFCCC (e.g. Green Climate Fund), ICAO (e.g. CORSIA) and other multilateral agreements. It also considers opportunities to use these sources to leverage private sector impact investing, green bonds and other sources. Critically, it also reiterates the need to put in-place strong systems of governance and monitoring, reporting and verification, and addressing barriers for private sector investors looking to fund projects in PNG.

In summary, the five primary objectives of this report are to build on existing work focused on climate finance opportunities for PNG, and:

1. Provide an update as to the latest developments in international climate finance;
2. Consider impact investing and other sources of finance to support sustainable land management and the National REDD+ Strategy and associated REDD+ Finance and Investment Plan (RFIP) in PNG;
3. Consider the intersection of climate finance and impact investing, and how each can assist in co-financing projects and initiatives in PNG; and,
4. Identify the key barriers and actions to attract private sector finance to PNG.

Importantly, this report does not propose new ideas to solve the barriers to climate finance and private sector impact investment for sustainable land management in PNG – rather, it seeks to draw together existing ideas (e.g. from government and consultancy reports) as a way of synthesising these ideas into a central document and step-by-step roadmap that GoPNG can refer to and use for moving forward.

3.0 How much finance does PNG need? How much can GoPNG provide?

Analysis currently underway by UNDP suggests that approximately $200-300 million of core financing (an equivalent increase of 50% on existing government budgets) is required to help meet the targets for avoided deforestation and emissions under the NRS, and be invested into two critical components:

Component 1 – REDD+ Action Areas:

- Strengthen land use and development planning
- Strengthen environmental management, protection and enforcement
- Enhance economic production and sustainable livelihoods

Component 2 – REDD+ Coordination and Reporting

- Establish systems for coordinating and reporting on actions related to REDD+
- Summary of green goals.

Importantly, undertaking these actions (especially those listed under Component 1) would also indirectly address several key barriers to FDI in PNG, and help catalyse private sector impact investment in projects such as plantation development, conservation and sustainable agriculture. Through this impact investment, these projects will deliver social, economic and environmental benefits, while also indirectly helping PNG to meet the NRS targets. This initial investment of $200-300 million will be a key ingredient to attracting billions of dollars in FDI, which is needed to scale-up PNG's sustainable and mainstream primary industries of the future.

4.0 Global impact investment trends

International public climate finance alone is unlikely to be enough to meet national REDD+ targets. A far greater pool of finance exists beyond government financing mechanisms for projects and programmes that can deliver environmental and social benefits alongside finance returns – particularly those that help meet UNDP's Sustainable Development Goals (SDGs). This funding pool is often termed *impact investment*, and for PNG can be considered as an important part of its future Foreign Direct Investment (FDI) flows, if PNG can address several barriers to its deployment. This section provides a general overview of global impact investment trends and how it can be paired with international climate finance sources. The purpose of this section is to provide readers with a sense of the scale of investment that it potentially there for PNG's taking, and get readers to think beyond international government climate finance as the main source of investment for PNG.

4.1 Overview of impact investing flows

The intention of "impact investing" is to create positive and measurable change across social and environmental outcomes, while earning an economic return on investment, is what differentiates impact investing from other economic investing techniques. [27] [28] [29] [30] [31] The sought-after returns may differ across these three branches of sustainability and are ultimately determined by the short and long-term strategic goals of the investors.[27] [32]

Impact investing is a versatile economic tool that can be utilised across both developed and developing markets, countries and asset classes to produce various rates of return on investment.[27] [33] There are two broad types of impact investing techniques. Concessionary investments are those that accept below-market economic returns to realise greater social or environmental benefits of the investment; thus, they hold a higher risk profile.[33] [34] Non-concessional investments are those that expect social and environmental benefits alongside above-market rate economic returns.[34] [35] These can also be referred to as impact-first (concessionary) or thematic (non-concessional)35.[35] Concessionary investments can mobilise non-concessional investment by mitigating the risks; increasing the likelihood of market or above-market rate returns; and reducing capital costs; all of which will improve the risk-return profile of an investment, making it more appealing to traditional non-concessional investors. [34] [33] [36] [37]

A diverse set of asset classes can be used to participate in impact investing, such as: grant support, equity, subordinated loans, senior loans, cash, cash equivalent, guarantees, fixed income, real assets, and public and private equity.[27] [38] [39] These asset classes can be used to support projects in various investment themes such as: sustainable agriculture, land and forestry management; affordable housing; healthcare; education; climate change adaptation and mitigation; conservation; social equity; energy; sustainable livelihoods.[32] [38] [40] [41]

Another key characteristic of impact investing is the measuring and reporting of the triple or double bottom line performance of the investment to provide transparency and accountability to all stakeholders.[27] [30] Impact investors should aim to clearly state the social and/or environmental objectives of the investment; set and monitor performance metrics against the objectives, using standardized metrics when possible; and, report on the triple or double bottom line performance of the investment to all relevant stakeholders.[27] [34] When verified reporting isn't available, many impact investors will settle for accepting the creation of additionality; the concept that a positive outcome would not have occurred if it was not for that investment.[42]

Impact investing allows investors to provide both financial and operational support to their investees.[34] This can help improve both the output of the investment (products, goods and services) and the outcomes (the effectiveness of the outputs on creating positive change and achieving the objectives).[34]

4.2 Changing investor sentiments

As society becomes progressively aware of existing and potential social and environmental issues, an increasingly large number of organisations, businesses and governments are becoming involved in creating solutions to these problems. As such, a greater number of traditional finance investors are participating in impact investing, in turn creating higher demand for suitable projects. [43] [44] This is reflected by the fact that the impact investing market was estimated at Assets under Management (AUM) $77 billion in 2016 but has grown to a value of AUM$502 billion in 2018 (across 1,340 organisations); and that investors surveyed by GIIN have seen returns of 13% per annum in their impact investment portfolios over 5 years.[29] [39] Overall, this research indicates that a significant amount of capital is at work to address the world's social and environmental challenges, and that the impact investing market continues to grow rapidly, with new investors entering to establish impact investing practices and to allocate additional capital to positive impact.[45]

The impact investing landscape has changed significantly over the last decade, as both the types of investments occurring and the investors themselves have changed.[46] Historically, impact investing was exclusively the domain of venture capitalists, development finance institutions, non-governmental organisations and government agencies - these types of investors were willing to accept the high-risk profile of a burgeoning sustainability focused investment market. [28] [29] Concessionary investments were common from these investors, and came in the form of donations, grants and below-market rate loans. [29]

While it is still common for these to be the initial investors in an impact investing opportunity, the participation of these players signals proof of concept of impact investing to traditional investors such as pension funds, insurance companies, banks, private firms, family foundations, and high-net-worth individuals.[27] [28] The maturing of the impact investing market, the realisation of the business and economic risks posed by social and environmental deterioration, increasingly stringent government regulations and multilateral agreements (such as the Sustainable Development Goals), heightened business competition and increased demand for sustainability from customers, are all driving factors motivating participation in impact investing by traditional investors.[27] [41] [43] [47] [48] [49] Traditional investors provide entry-level gateway to clients new to participation in impact investing, as well as being vital to scaling-up impact investing and maturing and promoting the market. [27] [28] [50]

Insurance companies also see impact investing as a risk-mitigation vehicle - it creates positive social and/or environmental improvements, thereby reducing the likelihood or severity of a catastrophic social or environmental event triggering an economic crisis.[48] Similar to insurance companies, Credit Rating Agencies (CRA's) understand that environmental issues could create economic risks and are combating this issue by including environmental, social and governance risk factors into their credit ratings procedures.[51] [52] By CRA's highlighting these risk factors, potential impact investors can be better informed as to the risk-ratio-impact profile of a potential investment and asset is against their own criteria checklists; and impact investments that address these risks can gain better credit scores.[31] [51]

4.3 Underlying risk drivers for a changing investment landscape

The change in investors, their desires and level of participation in impact investing is being driven by a variety of risks.[46] The potential for environmental and social deterioration to cause an economic crisis is the dominant driver; investors are attempting to mitigate this risk by investing in impact investments that can create outcomes to reduce this deterioration and the likelihood of any adverse economic effects.[51] Legislative requirements and multilateral agreements relating to the environmental and social performance of businesses are becoming increasingly common and stringent [53]. Businesses are reducing the risk of non-compliance (and any associated economic costs) through investing in relevant impact investments.[54] Customer expectations regarding sustainability are changing and businesses failing to meet these run the risk of reputational and customer loyalty loss. Impact investing offers the

opportunity to prove a business' commitment to double or triple bottom line sustainability and reduce this risk.[55]

Importantly, investors are requiring new finance criteria be met to mitigate the downside legal, market and reputational **risks** associated with goods and services that degrade environmental assets. This is increasingly being reflected in assessments by CRAs (e.g. Moody's and S&P), statements by regulators (e.g. the Australian Prudential Regulation Authority), powerful investor disclosure initiatives (e.g. CDP), and ultimately, in higher insurance premiums. This change in investor sentiment is nudging producers and supply-chain managers to seek alternative business models that improve environmental and social conditions, and that address consumer concerns e.g. chemicals in food, deforestation and waste.

4.4 Barriers to impact investment

4.4.1 General barriers

There are myriad barriers that can deter investors and influence the effective widespread implementation of impact investing.[49] Impact investing usually happens on a smaller scale compared to similar private equity investments; and this small deal size in combination with the need for significant up-front capital investment, transaction costs and unclear risk-return-impact profiles may make the investment financially unattractive to traditional non-concessional investors, regardless of the potential social and environmental outcomes. [34] [41] [29] [56]

A lack of clear definitions and standards on impact investing and its: objectives, outcomes, measuring standards and triple bottom line viability can lead to confusion amongst those new to the market and can allow for 'green washing' that could undermine the reputation of impact investing amongst the financial community. [31] [27] [29] [30] [57] Even when standardised metrics are provided by The Impact Reporting and Investing Standards (IRIS) and Global Impact Investing Ratings System (GIIRS), the measurement and reporting of these comes at an economic cost that conventional investor may not be willing to accept.[34] This difficulty in reporting in combination with the nascent nature of impact investing makes it difficult to prove triple bottom line results and risk-return-impact profiles; estimate pay-back periods or future projections; and to foster information dissemination and education (this last point is also impacted by the lack of knowledgeable intermediaries.[29] [31] [34] [58]

The small size of the impact investing market and small number of transactions (because it's an emerging market), difficulty in reporting results causing transparency issues and unclear legislation all culminate to negatively influence the liquidity of impact investments; both how quickly the assets could be sold, and the price paid for them.[36] [59] This limits the options available when exiting an invest, which can deter investors as it increases risk.[28] [36] [59]

Without clear governmental policy regarding social and environmental development it can be difficult for investors to determine their legal requirements and the potential longevity and relevance of an investment; therefore, running the risk of stranded assets. [34] [36] [60] Governmental uncertainty and volatile currency prices in certain countries can make it difficult to determine the long-term financial viability of an investment, and can negatively impact an assets liquidity, and an investee's ability to pay back the investment. [61]

A lack of demand for socially or environmentally sustainable goods and services can make it difficult for certain impact investments to produce economically valuable outputs; this limits their ability to provide positive social and environmental outcomes or economic returns to investors.[43] Longer holding periods may be required for these investments to secure financial returns which can increase the risk profile.[28] [34] [56] These barriers can negatively impact the scalability of impact investment projects and the impact investing market by limiting investor involvement and project creation. [62] [63]

4.4.2 Barriers to impact investment in the South Pacific

Along with the general barriers mentioned above, impact investing in the South Pacific faces a distinct set of challenges unique to the region. The investment 'enabling environment' for Foreign Direct Investment in the South Pacific (e.g. lack of infrastructure, communications and transportation links, political instability, access to land) remains particularly weak.

Developing countries, such as PNG, are particularly susceptible to corruption and this can deter investors (both impact and conventional) as it wastes resources, undermines credibility and growth of the investment, causes conflict, reduces the likelihood of positive social and environmental outcomes and can cause irreparable reputational damage.[64] [65]

Cultural differences may present issues for investors operating in the Pacific; namely the concept of "island time" which refers to the concept that it is important to take a relaxed attitude to life as all things will happen in good time.[66] For impact investors, this may cause confusion in communication and delays in project progress and outcomes.[66] [67]

The isolated location of South Pacific island nations as well as their lack of physical and governmental infrastructure can make international and domestic trade difficult.[68] [69] This physical isolation in combination with small market size increases the cost of trade; this could affect the returns-profile of an impact investment.[69] Many Pacific island nations also lack strong regulation, contract enforcement, access to finance and a high-skilled work force.[68] It is these challenging business environments that deter many traditional investors but open the potential for impact investors who are willing to accept the associated higher risks of these conditions.[69]

A lack of legislative support for sustainable land management and impact investing, as well as insecure land tenure are barriers specific to impact investing in the Pacific.[58] Much of the farmland in PNG is under customary land tenure, thus making it difficult to govern land use practices with governmental legislation to foster involvement in impact investing or sustainable land management practices.[70] In developing countries, it is always beneficial to have local knowledge when seeking out investment opportunities, thus it can be difficult for investors and their investments to operate effectively without previous business experience or connections in that country.[34] [60]

While there are substantial challenges, like for any investment type (e.g. mining) these can be overcome and/or managed with the right government support and incentives, and equitable benefit sharing with the community – including in PNG.

4.4.3 Barriers to impact investment in PNG

PNG's natural barriers include rugged terrain and topography, fast flowing waterways, swamps and extensive tributary systems, remote islands, and the cultural diversity of dispersed communities. Investment is physically constrained by access to land with secure tenure and title, and reliable utilities such as electricity, water and sewerage. An unreliable and fragmented transport network (road, sea and air) create additional barrier and often significant costs. From an economic point of view, these barriers and costs result favour manly large-scale businesses which can afford to absorb them during the start-up of a new project or enterprise.

Fundamentally, PNG is a tough and volatile place to do business. In 2018, it placed 109th out of 190 economies surveyed in the World Bank's "Doing Business 2018" report (the same position as in 2017). While an improvement over its 141st rank in 2014, these latest results highlight the challenges to market entry that are dampening FDI appetite. PNG's performance did improve across most of the World Bank's indicators, however it ranks low regarding contract enforcement (171st), insolvency resolution (141st), business start-ups (129th) and registering property (122nd). On the flipside, and despite a low credit rating, PNG ranked 42nd in terms of credit access, 89th for protecting minority investors and 91st for paying taxes.

The challenges of doing business are reflected in volatile FDI trends. The UN Conference on Trade and Development (UNCTAD) reported that FDI inflows to PNG have dropped rapidly from $33.5 million in 2005, to $29.1 million in 2010 and to $28.2 million in 2015. According to data from the World Bank, FDI inflows contracted to -$12.4m in 2016, with outwards investment also volatile in going from $6.5 million in 2005 to just $370,000 in 2010, then spiking to $173.8 million in 2015 and then dropping back to just $40,000 in 2016 UNCTAD). The 2015 spike coincides with the year that Bank South Pacific bought Westpac's operations in the Pacific Islands for $96.7 million. Although the macroeconomic slowdown that saw GDP growth decline from 12.5% in 2014 to 2.2% in 2017 is in large part to blame for falling FDI, as noted above, investors also face a challenging business environment characterised by limited infrastructure, ongoing foreign exchange shortages and several regulatory challenges. This has also impacted government budgets and public services, stalling economic development. Since the downturn in 2015, GoPNG has rightly implemented substantial budget expenditure cuts to aid in maintaining economic stability. Compounding these budgetary issues is the desperate need for public services - over 2 million Papua New Guineans (around 27% of the population) are poor and/or are facing financial hardship, with around 80 to 85% residing in traditional rural communities that mostly secure their livelihoods through subsistence garden agriculture and small-scale cash cropping.71

Other issues specific to PNG also persist and create investment barriers. These include securing access to land required for projects through the prevailing system of customary land tenure in PNG, and land use planning and data issues, as noted extensively by in several reports by the Coalition for Rainforest Nations.

Mobilising finance to conserve native forests and support sustainable land management enterprises that deliver REDD+ results, while also supporting community development, faces all these challenges (and others, such as potential double-accounting for GHG reductions) like most sectors in PNG. As noted by the NRS, while many of these issues go beyond REDD+ and will take significant time to address, there is potential to take carefully planned and targeted actions to address several areas of project risk to create a more attractive destination for private sector investors. These actions are explored in the following section.

4.5 Why would impact investors be attracted to PNG?

Despite the barriers, there are many reasons why impact investors may be interested in PNG when seeking financial returns alongside environmental and social benefits. These include:

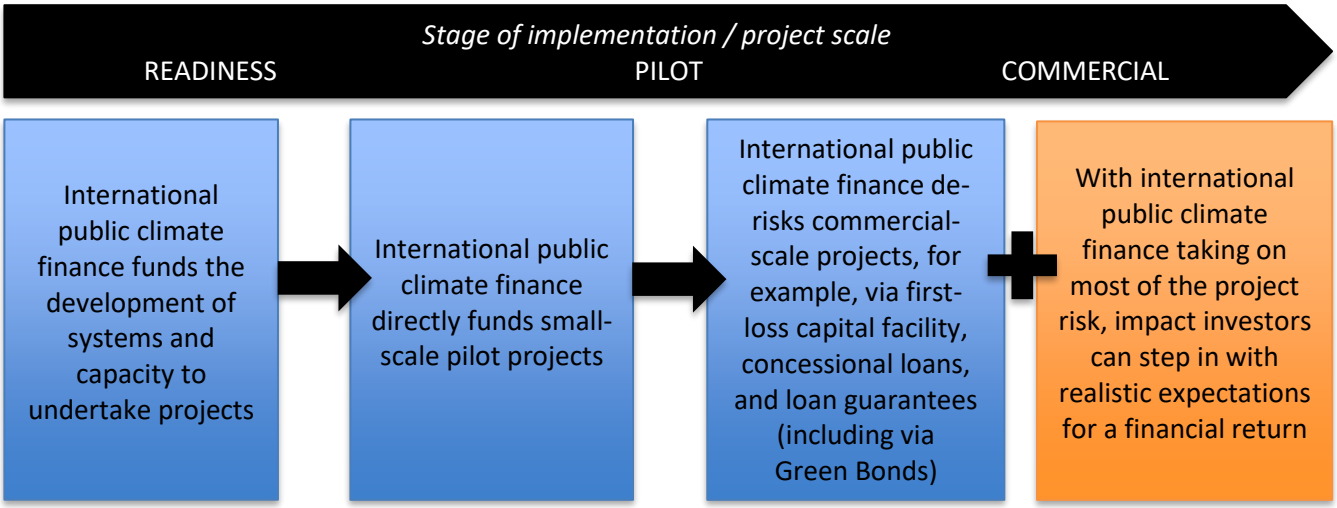
- PNG having a strong story to tell around its relatively healthy natural capital assets, ecosystem services and cultural history i.e.
    - Its 280,000km^2 of forests are mostly ecologically in-tact, with just 25% cleared nationally, and are a significant regulator of the global climate through storing an estimated 480 million tonnes of carbon while maintaining the quality of water and preserve soil stability;
    - PNG has 2.4 million km^2 of ocean that includes over 7,000km^2 of coral reefs and 4,200km^2 of mangrove forest (also significant store of Blue Carbon), with around 2,800 species of fish;
    - The nation has a rich cultural history, with the PNG islands being colonized by humans circa 50,000 years ago, resulting in around 850 languages being spoken across the country; and,
    - Natural capital is enshrined in numerous legislation (including the constitution) and planning documents as a key part of the nation's future – this can act as powerful and powerful signal for investors if GoPNG can demonstrate that it is truly committed to a nation that puts a healthy environment at the centre of its economy.

- The role that impact investors can potentially play (and be recognised for) in mitigating the risks to PNG's natural capital. One risk of concern to PNG's natural capital is the allocation of 3.8 million hectares of rainforest in Special Agriculture and Business Leases (SABLs), which would allow for their future deforestation – this includes in locations identified as being of very high conservation value. Clearing these native forests covered by SABLs would have potentially significant negative impacts for climate mitigation, biodiversity, water quality and fisheries. Impact investors, in combination with multilateral and bilateral climate finance (particularly a first-loss capital facility), could step in by providing capital investments to agricultural ventures that seek to intensify (rather than expand) landuse, and that manage land more sustainably through soil conservation, using fewer chemical fertilisers, pesticides and herbicides, and conserving riparian (riverside) buffer zones and coastal wetlands (for example).
- Complementing the point above, PNG's agriculture sector is currently largely undeveloped, and therefore somewhat of a "blank canvas" whereby new investment can be focused on building innovative systems for sustainable land management from scratch, rather than trying to change conventional systems and approaches to agriculture which are deeply entrenched in many other places around the world.
- PNG being close to major markets of Asia. Within 20 years, there is likely to be a new middle class of over 3 billion people in Asia-Pacific alone. International demand for food, particularly that which is of high-quality and produced through sustainably grown practices, is expected to double. Likewise, tourism is forecast to see double-digit growth, as people around the world scramble to experience unique and iconic landscapes and native wildlife in nature-focused tourism destinations such as Australia, New Zealand and the countries of the South Pacific.
- PNG has a relatively well-developed domestic banking and insurance sector, especially when compared to other South Pacific nations. Though there is limited trading, PNG has also set up its own capital market, with the Port Moresby Stock Exchange being on one of just two in the South Pacific (excluding Australia and NZ). Having a less concentrated banking sector can aid in increasing competition and in decreasing investment risk and costs.

4.6 The link between climate finance and impact investment

The term "climate finance" encompasses economic financing that can come from various sources, which is invested in projects that are undertaking climate change mitigation or adaptation practices.[72] Currently, the majority of the world's climate finance is being funded by Parties (governments) to the United Nations Framework Convention on Climate Change (UNFCCC) and is managed by the Global Environment Facility (GEF) and the Green Climate Fund (GCF).[72] The World Bank and the United Nations are the implementing agencies, working across projects that would also appeal to impact investors such as: conservation management, renewable energy development, drought resilience, pollution reduction, and sustainable land management.[100]

Impact investors, on the other hand, take the form of institutional investors (pension and insurance funds) and high-net-worth-individuals – both of which hold enormous potential for providing the private investment needed in climate finance in the coming decades.[42] The GCF and GEF would mitigate risks and provide proof of concept through their initial investment, thus making the risk-return-impact profile more appealing and encourage participation from impact investors.[42] [73]



4.7 What would a sustainable land management project, supported by both international climate finance and impact investing look like for PNG?

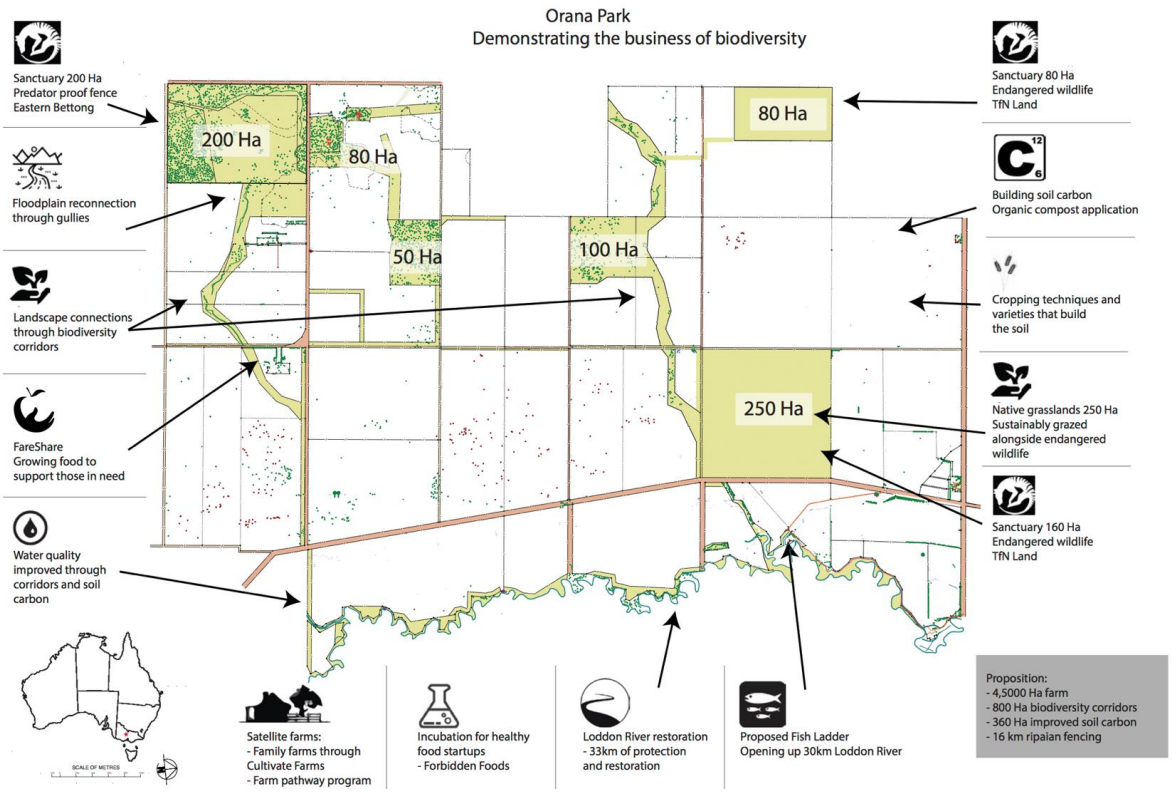
Sustainable land management projects are appropriate impact investments due to their potential to create economic returns alongside social and environmental outcomes; and the GEF and GCF currently invest in sustainable land management investments in the form of sustainable agriculture and forestry, and rangeland management.[74] Therefore, there is significant potential for impact investors and the climate finance community to work together to find and support such projects suitable for impact investment.

What would a sustainable land management project in PNG actually look like? It would most likely focus on sustainable agriculture and forestry (and possibly fisheries), because there are existing markets for the outputs produced (e.g. organic, fair-trade cacao) where some customers (e.g. in the EU) are willing to pay a price premium for these outputs; and holds significant potential to create social and environmental benefits in the developing countries where impact investment is currently focused.[31] [34]

A sustainable agriculture venture may be developed in many ways. A good example is the proposed development in Victoria, Australia of Orana Park (see below) – a mixed-crop 4,500ha farm that combines several different types of sustainably certified crops with soil and biodiversity conservation and restoration initiatives e.g. the restoration of riparian and protected area buffer zones, fish ladders for native fish, and support for local craft food initiatives. Orana Park has a great sustainability story to tell and is aiming to provide a market rate of return for investors. A similar integrated model could be adopted in PNG.

Project funding would be initiated in the form of concessionary financing from a multilateral organisation or government agency (most like GCF or GEF in the form of grants of low-interest loans and/or first-loss capital facility; or via national government tax incentives) to reduce the associated risks and provide proof of concept which would improve the risk-return-impact profile for investors.[27] This improvement would foster non-concessional investment from traditional investors and expose the project to the wider finance market.[34] [33] The latter may also include cashflows derived from, for example, the sale of accredited carbon offset units. Tax credits would also be issued to the value of agricultural production lost due to conservation covenants being put in place.

Example of climate finance impact investment compatible agriculture business



Source: Orana Park Farms

5.0 Potential international climate finance and impact investment opportunities

5.1 Overview

According to Climate Policy Initiative there is an estimated that the average global investment in climate mitigation and adaptation projects and initiatives to be $463 billion per annum.[75] More than 50% of this investment has been provided by the private sector, with this number increasing steadily as the costs and risks associated with low-carbon technologies and practices come down.

The following section provides an overview of the different sources of climate finance (public and private, mitigation and adaptation), and looks at how public climate finance can be used to leverage finance from the rapidly growing impact investment sector. It also considers the role that green bonds and other emerging financing options could play in meeting PNG's REDD+ targets and gearing it to be a natural capital centric economy.

5.2 Public sector finance

Public sector climate finance comes from both international (multilateral) and country-to-country (bilateral) sources. Since 2010, Pacific Island Countries (PICs) have been allocated approximately $1 billion in international climate finance. [76]

This section maps out the key multilateral and bilateral sources of climate finance and provides a snapshot as to priority for which PNG should assign to each going forward, based on its relative ease of access and scale of the potential financing option.

Importantly, PNG should not restrict itself to seeking just climate mitigation funding – climate adaptation focused funds, which provide support for climate smart agriculture projects and coastal wetland (mangrove) conservation - could also play an important role in meeting PNG's REDD+ financing requirements.

5.2.1 International (multilateral) public climate finance

United Nations Framework Convention on Climate Change

PNG is among the largest recipients of multilateral and bilateral climate finance in the South Pacific[76], having accessed approximately $440 million from a number of funds over the last two decades, including from: the Adaptation Fund (AF), the Climate Investment Funds (CIF), the Global Environment Facility (GEF), Global Climate Change Alliance (GCCA), the Forest Carbon Partnership Facility (FCPF), the United Nations Reducing Emissions from Deforestation and forest Degradation (UN REDD), the International Fund for Agriculture Development Adaptation (IFADA) for Smallholder Agriculture Programme, the OPEC Fund for International Development, and the Asian Development Fund (ADB).

Green Climate Fund

At COP 16, in 2010, Parties established the Green Climate Fund (GCF), and in 2011 also designated it as an operating entity of the UNFCCC's main financial mechanism. The GCF is accountable to the COP, which decides on its policies, Programme priorities and eligibility criteria for funding. Since operationalising, the GCF has disbursed $2.2 billion in climate finance across 100 or so projects. The GCF only funds projects in developing countries.

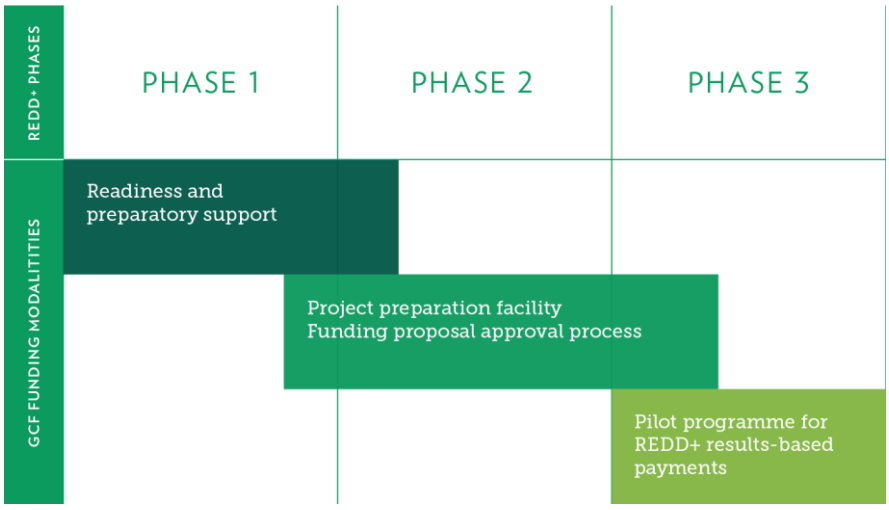
In brief, the GCF operates three funding streams –

- **The Readiness and Preparatory Support Programme:** a funding programme to enhance country ownership and access to the GCF ($1 million per country per annum, with an additional $3 million per annum for National Adaptation Plans);

- **Project Preparation Facility -** A total of $40 million has been made available for the initial phase of Project Preparation Facility, with each request capped at $1.5 million. Support is granted in the form of grants and repayable grants to undertake project identification, concept development and establishing the enabling environment, to mid- and late-stage processes including project due diligence and project structuring.
- **Project Funding (pilot and scale-up)** – under this stream, the GCF transfers financial assistance to a GCF Accredited Entity (AE) in the form of a loan, grant, equity, or guarantee - depending on the nature of the approved project. These funds are then used to support project implementation and operation. Typically, GCF then completes a series of financial disbursements during the life of the project, at key milestones.

The GCF does not implement projects – AEs are responsible for presenting funding applications to GCF, and then overseeing, supervising, managing and monitoring the overall GCF-approved projects and programmes. While GoPNG is the National Designated Authority (NDA) under the GCF, it is not an AE – therefore, it cannot directly apply for funding from the GCF. However, GoPNG can partner with AEs working in the Pacific such as ADB, UNDP, Conservation International, the UN Food and Agriculture Organisation (FAO) and the International Finance Corporation.

Within the GCF, a Pilot Programme with $500 million dollars earmarked per country for results-based payments (Phase 3, see below) for REDD+ has been established. Phase 1 of REDD+ includes developing national strategies or action plans, policies and measures, and other capacity building activities. Phase 2 includes implementing national policies and measures, and national strategies or action plans. Phase 3 consists of results-based payments following the verification of emission reductions.



Source: Green Climate Fund

Importantly, GCF has also set up Private Sector Facility (PSF) to channel institutional investment and leverage GCF's funds to encourage corporates to co-invest with GCF funds. The PSF is targets pension funds, insurance companies, corporations, local and regional financial intermediaries, and the capital markets to provide this co-investment. The GCF PSF combines financial instruments (e.g. debt, equity, and guarantees) with concessional funding to promote private sector investing in our core activities through:

- De-risking investments, including foreign exchange and investors' default;
- Bundling/aggregating small projects into portfolios, providing scale and making them attractive to institutional investors;
- Supporting capacity building amongst different groups and local institutions;
- Helping develop public-private partnerships for infrastructure resilience projects;
- Encouraging innovation, for example by overcoming scale problems and fragmentation within the supply chain; and
- Being active in the clean energy, climate resilience and sustainability communities.

An example of co-investment made by the GCF is it investing in a project run by Acumen that is designed to improve the resilience of smallholder farmers in Nigeria, Ghana and Uganda by shifting investment patterns in adaptation to long-term capital investment. This $51m received 53% in private sector co-financing, with GCF's funds essentially acting to de-risk investment (via a large equity injection, and kickstarted through a small grant). The GCF's $23 million equity investment was utilised as a catalytic first-loss capital (CFLC) facility (buffering the other $25 million in equity provided by Acumen), whereas the $3 million grant served as the basis for and technical assistance.

While GCF is potentially an important source of funds for supporting PNG (especially as it readies itself to implement actual projects). As PNG moves from readiness to implementation, GCF funds could be used in a variety of ways, including: tapping into the REDD+ pilot programme, and then, using GCF funds to leverage private sector / FDI investment through providing a first-loss capital facility to de-risk and attract projects. This would be the best use of funds. There is however much competition for implementation funding from other developing countries. PNG-based projects should therefore not consider the GCF as the only major source of funds – there are numerous others, as presented here. If PNG does seek to access the GCF, this would be best done as an Accredited Entity, allowing the CCDA to credibly claim to be the in-country funds manager and take the full 7% fee of the awarded funds which it could use to self-sustain its own operations.

Stage/Type of finance	Readiness, implementation, scale-up. Grants, equity, debt (including concessional loans), credit guarantees via establishing a catalytic first-loss capital (CFLC) facility.
Potential funding amount	High.
Finance priority for PNG	Moderate to High. Lots of competition for GCF funding.
Key ingredients to unlock finance	**Early stage / readiness** Partnerships with Accredited Entities (ideally, CCDA would become an Accredited Entity – allowing it to justify taking a 7% management fee as is currently enshrined in its national legislation) **Scale-up** GoPNG and partners to identify suitable projects. Establish systems (e.g. national carbon accounting and reporting framework, carbon offset registry) for "nesting" UNFCCC compliance (e.g. CORSIA) and voluntary carbon offset standard projects (e.g. VCS) in PNG's national carbon accounting framework, so carbon offset projects can be more readily developed and therefore tendered to facilities such as the GCF. Equitable, transparent and credible benefit-sharing systems.

The Adaptation Fund

Established under the UNFCCC, the Adaptation Fund (AF) was established to finance on-ground adaptation projects and programmes in developing countries that are parties to the Kyoto Protocol and are particularly vulnerable to the adverse effects of climate change. Since 2010, the Adaptation Fund has committed $564 million, including supporting 84 adaptation projects with about 6 million direct beneficiaries. The fund currently has a balance of $500 million.

The AF offers an opportunity to tap into adaptation finance in several areas that may have indirect REDD+ outcomes. These include in forestry focused and "community based, climate smart agricultural practices implemented in degraded areas to reduce climate risks vulnerability of production systems and sustain protected areas" (such as a project in Armenia). There are numerous projects currently in the active pipeline for the AF, which provide an example of the types of models that PNG may consider supporting REDD+ outcomes. AF finance is provided through National Implementing Entities (which PNG does not have), Regional Implementing Entities and Multilateral Implementing Entities (which have a 50% cap on cumulative funding amounts from the AF, and which include UNDP, ABD, IFAD, the World Bank and others).

There are many potential avenues for applying for and using climate adaptation funds (e.g. climate smart agriculture) to fund REDD+ indirectly. These funds must be applied for through a Multilateral Implementing Entity such as UNDP.

Stage/Type of finance	Readiness, scale-up and large-scale. Grants, concessional loans, technical assistance.
Potential funding amount	Moderate to High.
Finance priority for PNG	Moderate.
Key ingredients to unlock finance	TBA.

International Fund for Agriculture Development Adaptation (IFADA)

IFADA's Adaptation for Smallholder Agriculture Programme (ASAP) is the world's largest climate change adaptation programme with a specific focus on smallholder farmers. Since being operationalised in 2012, $300+ million has been deployed to at least eight million smallholder farmers to build their resilience to climate-related disasters. The ASAP co-finances and helps scale-up IFAD's $1 billion annual investments.

The ASAP includes funding for small-holder agriculture projects that improve land management and promote gender-sensitive, climate-resilient agricultural practices and technologies, through: rehabilitating natural systems such as mangroves, coastal wetlands, sand dunes, and coral reefs to protect agriculture in coastal areas against climate risks; developing access to green markets and create incentives for climate-resilient products; and, developing capacities among local institutions to plan and adopt agroecological farming models in a changing environment.

Currently, no information is available for the next funding round.

TBA. Latest information and funding rounds currently being updated. May provide an opportunity to finance REDD+ indirectly via climate smart / sustainable agriculture projects focused at garden and subsistence scale garden agriculture.

Stage/Type of finance	TBA.

Potential funding amount	TBA.
Finance priority for PNG	TBA.
Key ingredients to unlock finance	TBA.

World Bank

In 2018, the World Bank provided a record-breaking $20.5 billion in finance for climate action across multiple sectors (energy, transport, landuse etc). Its most recent carbon instruments aim to scale-up emission reductions, focus on readiness for market-based carbon initiatives, increase access to energy in least developed countries, and reduce emissions from deforestation and forest degradation. These carbon initiatives have a total fund allocation of $1+ billion and $0.5 billion for technical assistance.

Global Environment Facility Trust Fund

Originally established by the World Bank in 1992, GEF has disbursed around $18 billion (leveraging $93 billion in co-financing) since its formation. The 7th GEF replenishment cycle (GEF7) has a *focus on "o*n transforming food systems, sustainable forest management, and cities is not only good for the planet and human well-being, but an enormous business opportunity*".* [77] As of April 2019, there was approximately $4 billion available in the GEF Trust Fund to support the GEF7 replenishment funding cycle. In accordance with the agreed resource allocation framework, the GEF7 envelopes for the three focal areas are US$1,292 million for Biodiversity ($17.3 million allocation for PNG), US$802 million for Climate Change ($1 million allocation for PNG), and US$475 million for Land Degradation ($1 million allocation for PNG).

GEF 7 provides an opportunity to support the development of sustainable agriculture and forestry industries. It is however a relatively modest opportunity, with a capped allocation of <20 $million.

Stage/Type of finance	Early stage/readiness, pilot. Grants.
Potential funding amount	Just under $20m available to PNG.
Finance priority for PNG	Moderate to high.
Key ingredients to unlock finance	Grant funding requiring application – currently under development by UNDP and other stakeholders.

Forest Carbon Partnership Facility

Most notably for sustainable land management, the World Bank's Forest Carbon Partnership Facility (FCPF) is a partnership of 47 developing countries, including PNG, which aims to provide financial and technical assistance for developing readiness through its readiness fund - PNG received $3.8 million readiness preparation grant from the FCPF (2015-2018).

The Carbon Fund

Under the FCPF, the World Bank also established "the Carbon Fund", which is intended to catalyse REDD+ implantation and scale-up. Building on the experience of previous pioneering initiatives (such as the BioCarbon Fund), the Carbon Fund's objective is to provide performance-based payments for verified emission reductions from REDD+ programs in countries that have made considerable

progress towards REDD+ readiness. Finally, over 10 years after being established in 2008, in February 2019 the FCPF reportably signed its first REDD+ deal with two African countries, worth $100 million.

The capitalisation of the Carbon Fund is not disclosed publicly. As PNG moves from REDD+ readiness from implementation, the World Bank's FCFP Carbon Fund may be of interest when looking to support on-ground pilot projects for performance-based REDD+ payments. Though slow to establish, recently substantial performance-based deals have reportably been done. However, two fundamental barriers to carbon offset performance-based projects remain for PNG, making it a less attractive investment destination: 1) the inability to "nest" project emissions reductions under the national carbon accounting frameworks; and, 2) the difficultly in dealing with landholders and/or securing legal tenure over carbon credits.

Stage/Type of finance	Pilot, scale-up. Performance-based.
Potential funding amount	Moderate.
Finance priority for PNG	High.
Key ingredients to unlock finance	GoPNG and partners to identify suitable projects. Establish systems (e.g. national carbon accounting and reporting framework, carbon offset registry) for "nesting" UNFCCC compliance (e.g. CORSIA) and voluntary carbon offset standard projects (e.g. VCS) in PNG's national carbon accounting framework, so carbon offset projects can be more readily developed and therefore tendered to facilities such as the Carbon Fund. Equitable, transparent and credible benefit-sharing systems.

ADB

In 2017, the ADB mobilized a total of $5 billion in total climate finance, with 80% expected to contribute to mitigating climate change and 20% to adaptation. It administers several funds of potential support to PNG. As of April 2019, the ADB had 11 active climate finance facilities, with $250 million in available (uncommitted funding). The following funds may be relevant to supporting REDD+ targets and sustainable land management initiatives in PNG.

ADB Climate Change Fund

The ADB Climate Change Fund provides financing through supporting the grant component of investments, providing technical assistance (either stand-alone and piggy-back, or linked to loan), and direct charge. The fund has four priorities: (i) adaptation, (ii) clean energy development, (iii) reduced emissions from deforestation and forest degradation, and improved land use management (REDD+ and land use); and (iv) climate finance readiness. As at April 2019, $13 million of funding remained uncommitted.

Currently has uncommitted funding of $13 million.

Stage/Type of finance	Early, pilot, scale-up. Grants and technical assistance.
Potential funding amount	Small to moderate.
Finance priority for PNG	High. May be an alternative to GEF and be used to complement other funding sources.
Key ingredients to unlock	GoPNG and partners to identify suitable projects and initiatives.

finance	

ADB Asia-Pacific Climate Finance Fund

The Asia-Pacific Climate Finance Fund was established in April 2017. Its objective is to support the development and implementation of financial risk management products that can help unlock private sector capital for climate mitigation and adaptation investments. Relevant to PNG and REDD+, the fund supports financial risk management products that aim to mobilize new sources of private sector financing (e.g. green bonds) and in investing in sustainable land management and climate smart agriculture. As of April 2019, $33 million of funding remained uncommitted.

Currently has uncommitted funding of $33 million.

Stage/Type of finance	Pilot, scale-up. Risk mitigation (e.g. Loan guarantee, CFLC facility).
Potential funding amount	Moderate to High.
Finance priority for PNG	High – many investment risks in PNG, a very useful instrument to complement other finance sources.
Key ingredients to unlock finance	GoPNG and partners to identify suitable projects and initiatives. Intermediaries (or other well-experienced institutions such as Althelia Climate Fund) required to assist in blending with other financial instruments.

ADB Canadian Climate Fund for the Private Sector in Asia II

Established in 2017, the Canadian Climate Fund for the Private Sector in Asia II is a $150 million fund designed to leverage more private sector participation in climate change mitigation and adaptation in small island developing states in Asia and the Pacific. The fund also seeks to promote greater levels of gender equality and the empowerment of women and girls in projects it supports. Once deployed, the fund will aim to help the private sector overcome key barriers to investment brought about due to market, technology, financing, regulatory and other risks. It will offer concessional financing terms and conditions (senior loans, subordinated loans and risk participations) to projects that would not otherwise proceed on a commercial basis. It will provide funds to activities relevant to REDD+ and sustainable land management, specifically "Agriculture and forestry", "Land use management", and Natural resource management". As of April 2019, $150 million of funding remained uncommitted (with fund still to be deployed).

Currently has uncommitted funding of $150 million (to be deployed).

Stage/Type of finance	Scale-up. Concessional loans.
Potential funding amount	Moderate.
Finance priority for PNG	Moderate.
Key ingredients to unlock finance	To be advised.

International Finance Corporation (IFC)

The International Finance Corporation (IFC) has recently began offering investors the option of structuring loans in accordance with the Green Loan Principles (GLP). Green loans are made available

by banks to exclusively finance/re-finance new and/or existing eligible green projects and are governed by a set of principles modelled on GLPs and developed by the Asia Pacific Loan Market Association. As relevant to PNG and REDD+, the IFC's GLP loans are available to green projects that address issues such as climate change, natural resources depletion, loss of biodiversity, and air, water and soil pollution.

As relevant to PNG and REDD+, the IFC's GLP loans are available to green projects that address issues such as climate change, natural resources depletion, loss of biodiversity, and air, water and soil pollution. These loans could be used to develop new and scale-up existing sustainable agriculture and forestry projects where there is a commercial return. Part of a blended finance approach, and ideally paired with a CFLC facility and performance-based payments.

Stage/Type of finance	Scale-up. Concessional loans.
Potential funding amount	High.
Finance priority for PNG	High.
Key ingredients to unlock finance	GoPNG and partners to identify suitable projects and initiatives. Intermediaries (or other well-experienced institutions such as Althelia Climate Fund) required to assist in blending with other financial instruments.

OPEC Fund for International Development (OFID)

OFID helps developing countries pursue their social and economic development by providing financial assistance towards the realization of their specific development goals. OFID pays attention to the interrelated challenges of securing access to energy, food, and water, which it considers to be the three main obstacles to poverty alleviation in the developing countries This support has been provided in the form of both loans and grants for infrastructure construction, capacity-building, and research and development. In addition to loans and grants to community-based projects, OFID also operates Private Sector and Trade Finance Facilities which provide targeted assistance to dealing with barriers to entry into new markets. Since its inception, OFID has provided $3.4 billion to projects in developing countries, including around $2.2 billion to improving financial systems.

OFID may provide an opportunity to tap into funding to deal with FDI barriers to sustainable agriculture and forestry (and indirectly REDD+) and strengthen related governance systems for PNG. It may also provide ways to develop lines of finance to support smallholders and communities to access new markets i.e. helping them to sell sustainable cocoa and palm oil products – such mechanism could complement REDD+ project finance.

Stage/Type of finance	Readiness, pilot and scale-up. public sector loans, direct support to private enterprise, trade financing, and grants.
Potential funding amount	Moderate.
Finance priority for PNG	Moderate.
Key ingredients to unlock finance	Identify needs to strengthen financial and governance systems, and whether OFID is a suitable form for support.

5.2.2 Bilateral (Country-to-country) climate finance

To date, the largest recipients of bilateral climate finance have been Samoa, Tonga, Vanuatu, Solomon Islands and Papua New Guinea. Access to bilateral finance is often more straight-forward,

and generally involves lower transaction costs and more flexibility than multilateral finance sources. There is a growing trend in climate finance and Overseas Development Assistance (ODA) being channeled directly to countries through bilateral arrangements than through regional organisations in the Pacific – particularly amongst highly industrialized countries who have obligation to reduce emissions under the Paris Agreement and whom have a geopolitically strategic security and/or trade interest in the region. [76]

The largest sources of bilateral climate finance to the Pacific (from highest to lowest) are the Australian Department of Foreign Affairs and Trade (DFAT), USAID, European Union, New Zealand Ministry of Foreign Affairs and Trade (MFAT), JICA, the German International Climate Initiative, China, the German Ministry for Economic Cooperation and Development (BMZ), the United Kingdom International Climate Fund, the Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ), the International Climate Change Adaptation Initiative, and the Norway International Climate Forest Initiative. [76]

These sources and amounts of bilateral climate finance largely coincide with the countries that form PNG's major trading partners. According to 2017 World Bank data: Australia is by far PNG's largest trade partner in 2017, with some $2.8 billion in imports from and $1.6 billion of exports to Australia; followed by other major trade partners such as Singapore ($254 million in exports, $1.2 billion in imports); Japan ($533 million in exports, $528 million in imports); China ($302 million in exports, $575 million in imports); Malaysia ($58 million in exports, $527 million in imports); and, Germany ($318 million in exports, $72 million in imports).

More recently, APEC suggested that PNG may make a high-profile shift towards China as a favoured bilateral partner, a strategic move that could have profound consequences for its traditional allies. A proposed Free Trade Agreement (FTA) with China was announced in April 2018. This came immediately after Rimbink Pato, PNG's minister of foreign affairs and immigration, visited Beijing, and less than a week after two Chinese-funded projects – the Port Moresby International Convention Centre and a new six-lane highway – were inaugurated. Few public details exist, China's FTA website now lists PNG and Fiji as "under consideration" for an agreement. Chinese President Xi Jinping visited PNG in November 2018, where he and Prime Minister Peter O'Neil signed a comprehensive strategic partnership – this included a $300 million soft loan for PNG, which must be used to finance China-approved infrastructure and resource projects. PNG owes almost $590 million owed to China, making it China's biggest debtor among Pacific islands. Two days after the China-PNG announcement, PNG, Australia, Japan, New Zealand and the United States announced at APEC leaders' summit that they intended to join together in a $1.7 billion 'Papua New Guinea Electrification Partnership' in support of Papua New Guinea's objectives for electrification. Around the same time, PNG's then Sovereign bond issuance was largely focused on refinancing Chinese debt, with the US government being the main investor.

There are also numerous other bilateral initiatives focused on addressing general barriers to investment in the Pacific, including PNG. While not directly climate related, some will indirectly open up FDI opportunities for sustainable agriculture and forestry businesses, helping to meet REDD+ objectives. Many of these are due to expire in 2019, leaving post 2020 initiatives open for discussion and proposals.[78] A key initiative to keep an eye on is the $2 billion Australian Infrastructure Financing Facility for the Pacific, which is currently being designed (due to be operationalised in July 2019), and is likely to include criteria for developing green infrastructure projects.

These developments (and many others) highlight the rising regional competition between Australia and other Western powers, and China. Several important stakeholders, including the Business Council of PNG, have welcomed a potential FTA. Increased access to the Chinese market could have important implications for REDD+ and sustainable land management in PNG. On the negative, without careful management land clearing rates could accelerate due to new investment supporting the expansion of new and existing mines (e.g. Chinese-owned Ramu nickel mine) and large-scale

agriculture and forestry projects. On the positive side, for example, a FTA could allow PNG to sell sustainably certified super premium agricultural (organic food) and forestry products (FSC timber) into the Chinese market – currently the largest and fastest growing consumer market for sustainable products world-wide.[79] Such activities could be backed by bilateral climate finance from these major trading partners, achieving the triple benefits of sustainable growth, climate mitigation and adaptation (meeting the source country's Paris Agreements through transfer of carbon credits), and geopolitical influence. For example, Australia is likely to be caught short in meeting its 2030 Paris NDC and has flagged the possibility of buying international carbon offsets.

Another existing but changing market for sustainable products also exists in the EU. An interim economic partnership with PNG allows for duty-free exports to the EU. Palm oil, which has long been one of the PNG's main exports, accounts for a significant share of its export receipts to the EU (in 2017 exports rose by 26.9% to approximately $750 million). However, the EU voted in April 2017 to prohibit sales of biofuels made by vegetable oils, with the EU's palm oil imports falling by 10% in 2017 on the back of an anti-palm oil movement. PNG's trading relationship with the EU could face further pressure because of the UK's vote in favour of Brexit – this has caused significant uncertainty around future trade between PNG and the EU.

Although Brexit has clouded the outlook, EU investors continue to make inroads into PNG. Importantly, the European Investment Bank (EIB) announced in 2017 it had been given a mandate to expand infrastructure investments in the Pacific region, including in PNG. The EIB's infrastructure works in PNG will focus on building and restoring roads, power plants, bridges and water utilities. There has also been a push to include "green infrastructure" within that mandate, such as engineered wetland and the conservation of coastal wetlands, that if included could open support for indirectly achieving REDD+ targets. The EIB's "AAA" credit rating means it can offer lower interest rates and lending in US dollars - an important consideration given PNG's ongoing foreign exchange issues. In addition, projects that attempt to address climate change will also be subsidised.

Bilateral climate finance is strongly tied to regionally-important trade relationships and strategic geopolitical aspirations. Traditionally, it has been provided through ODA channels (where no commercial return is required), however bilateral climate finance flows have been used to support the development of commercial opportunities in more recent years. PNG has an opportunity to capitalise on geopolitical interest in this respect, both from conventional regional partners of Australia and NZ, and from China and further abroad (such as the EU). As the country's biggest trade partner and ODA provider, Australia is likely to announce new ODA programs soon to fill the current policy void from 2020 onwards – this will unlikely happen until well after the May 2019 federal elections. A key initiative to keep an eye on is the $2 billion Australian Infrastructure Financing Facility for the Pacific, which is currently being designed (due to be operationalised in July 2019), and is likely to include criteria for developing green infrastructure projects.

Stage/Type of finance	All stages. Grants, concessional loans, equity investments.
Potential funding amount	High.
Finance priority for PNG	High.
Key ingredients to unlock finance	TBA.

5.2.3 Green bonds.

See Section 5.3.4.

5.3 Private sector finance

This section focuses on finance primarily derived from the private sector. This includes investment driven due to government policy (e.g. national carbon pricing initiatives, CORSIA), commercial opportunity (e.g. voluntary carbon markets, impact investment in real assets and green bonds) and philanthropic giving by individuals and corporates.

5.3.1 Compliance carbon markets

There are primarily four types of compliance carbon markets: two types at the international level, the UNFCCCs New Market Mechanism and ICAO's Carbon Offsetting Reduction Scheme for International Aviation (CORSIA), national carbon pricing initiatives and sub-national/regional carbon pricing initiative. The status of each type is summarised below.

The Clean Development Mechanism (CDM) and the New Market Mechanism (NMM)

Compliance markets were first created at the international level under the UNFCCC's Kyoto Protocol (which is due to end at the end of 2019). The Kyoto Protocol effectively established a country-to-country cap-and-trade system, which was underpinned by mandatory national GHG reduction policies. The Kyoto Protocol set caps (targets) on GHG emissions of 39 developed countries (later reduced to just during the second commitment period). The country-to-country tradable permits were designated Assigned Amount Units (AAUs), which were *stapled* to equivalent carbon permits (or allowances) within a specific country's cap-and-trade system e.g. in Australia, these were called Carbon Units (CUs). When a company bought and retired one CU under the former Australian ETS, one AAU would then be cancelled at the UNFCCC level, lessening Australia's gap in meeting its Kyoto Protocol GHG reduction target. This process also occurred under the EU-ETS and NZ-ETS, two other major industrialised nations covered by the Kyoto Protocol.

The Kyoto Protocol, and subsequently some national emissions trading schemes, also allowed countries and companies to purchase carbon offset credits (different to permits/allowances, but also 1 tCO_2e) to be purchased via the Clean Development Mechanism (CDM). Under this provision, a KP participating country (or company within that country) can offset part of its emissions by implementing a project in a developing country (e.g. PNG) where the project can reduce emissions, and where the quantum of this reduction can be reliably measured. These measurable and verifiable credits are called Certified Emissions Reductions (CERs). CER's generated by projects in developing countries can be traded and sold to the developed countries. Like for permits (e.g. CUs), CERs are also stapled to and retired alongside the equivalent volume of AAUs.

Just two CDM projects have been registered for PNG, which are described as: 1) A "Programme of Activities (PoA) for Sustainable Renewable Energy Power Generation in Papua New Guinea"; and 2) "A Bundled project on methane recovery from wastewater treatment in Hargy Oil Palms Limited's, Two Palm oil mills located in Papua New Guinea". The first project's last contact with the CDM secretariat was in 2014 (project was not developed), and the second project was terminated during the validation cycle (last contact was in 2011). Neither have been issued CERS under the CDM. With regards to REDD+, the CDM does not recognize reduced deforestation, forest conservation or reduced forest degradation as eligible projects activities, but it does recognize reforestation and afforestation projects.

To date, the CDM has issued almost two billion CERs since its implementation in 2004 – resulting in approximately $300 billion in low-carbon investment in developing countries. Current demand levels for CERs are considerably lower than the supply potential from registered CDM projects - this has been the case at least since 2012 and has led to a prolonged period of low market prices for CERs. The average price per CER in the last five years has hovered around $1/$tCO_2e$ - too low to support many carbon offset project types, especially land use land use change and forestry projects,

including in PNG. With the Kyoto Protocol being discontinued from 2020 (and being replaced by the Paris Agreement), and it is not clear what the status of existing or pipeline projects under the CDM will be. There has been further price and policy uncertainty created by the announcement of the UNFCCC's New Market Mechanism (NMM) and Carbon Offsetting Reduction Scheme for International Aviation (CORSIA).

The UNFCCC is currently working to define the what "New Market mechanism" (NMM) means under the Paris Rulebook. A key question remained unanswered is whether the NMM is essentially a "CDM 2.0" (?) that provides a pathway for industrialized countries to pay for emissions offsets in developing countries to help them meet their Nationally Determined Contributions (NDCs) under the Paris Agreement. One of the most critical areas of disagreement in the recent COP in Katowice Poland involved the transition of CDM projects and CERs generated under the Kyoto Protocol into the new Paris markets that begin in 2021.

Regardless of the uncertainty, there is broad agreement amongst Parties to the UNFCCC that the NMM under Article 6 of the Paris Agreement must be more robust, accountable, transparent and-most importantly-sustainable, to avoid repeating the mistakes of previous market mechanisms i.e. a key contention was whether some CDM projects *needed* carbon credits to be financially viable.

The details of the UN's New Market Mechanism are yet to finalised as part of Article 6 of the Paris Rulebook – this will take place at the end of 2019. The key uncertainty is whether (or not) pre-2020 carbon credits will be rolled over to the Paris Commitment period.

Stage/Type of finance	Carbon offsets (performance-based).
Potential funding amount	Substantial.
Finance priority for PNG	Moderate to high.
Key ingredients to unlock finance	GoPNG to work with NGOs to assist local business and community groups to identify potential REDD+ projects, consider approaching specialized carbon funds, such as Althelia, on blended and community development-focused finance structures e.g. use of credit guarantees, concession loans, carbon credits, product certification. GoPNG to advance ways to better enforce contracts and provide grievance processes to mediate issues between local communities and investors. Consider approaching large international companies operating in PNG (such as those in its extractive industries, and its airlines) to be potential contracted forward buyers of carbon credits from PNG projects for voluntary / pre-compliance / compliance purposes.

Carbon Offsetting Reduction Scheme for International Aviation (CORSIA)

Aviation represents around two percent of emissions of global carbon dioxide (CO2), one of the main gases responsible for rising temperatures, according to the UN's International Civil Aviation Organization (ICAO).

In 2018, the implementation of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) was agreed to by 191 countries through ICAO, as the main mechanism to cap the carbon dioxide emissions of international flights at 2020 levels for the years 2021-2035 i.e. achieving "carbon neutral growth".

It is important to note that emissions from domestic air travel is not included in CORSIA, as these emissions sources, as per other domestic sources, are addressed under the UNFCCC and calculated

as part of the national GHG inventories and are included in national totals i.e. emissions from domestic aviation form part of a country's the Nationally Determined Contribution (NDCs).

Though it could choose to be exempt from the requirements of CORSIA, PNG has volunteered to participate in the following key phases of CORSIA.[80]

MRV Phase

Starting on January 1, 2019, all airlines flying international routes were required to monitor, report and verify (MRV) their CO2 emissions. The purpose of an MRV system for CORSIA is to collect data on international aviation CO2 emissions on an annual basis and compare emissions against the baseline emissions (2019-2020). The two components of the MRV system are: 1) monitoring fuel use on each flight and calculation of CO2 emissions (i.e. 1 tonne fuel burn = 3.16 tonnes CO2 emissions); and, 2) Reporting of emissions information between aircraft operators, States and ICAO – Verification of reported emissions data to ensure completeness and to avoid misstatements. This data must be collected by airlines, then reported to the national government to which it operates under, who will then in-turn report this to ICAO.

Least Developed Countries (LDCs), Small Island Developing States (SIDS) and Landlocked Developing Countries (LLDCs) are granted exemption, unless they volunteer to participate in this phase.

As PNG has volunteered to participate in CORSIA, there are four PNG-based airlines that should be currently considering how they meet the above MRV requirements. According to ICAO's "CORSIA Aeroplane Operator to State Attributions" [81] these airlines are Air Nuigini, PNG Air, Fubilan Air Transport and Hevilift Ltd.

Implementation Phases

CORSIA will then has three implementation phases, beginning 2021. Participation of countries till 2026 is voluntary[82].

1. **Pilot phase (2021 - 2023)** – Applies to Parties that have volunteered to participate in the scheme – this includes PNG. Under the pilot phase…
2. **First phase (2024 - 2026)** - Applies to Parties that have volunteered to participate in the scheme – this includes PNG. Under the first phase…
3. **Second phase (2027-2035)** - will apply to all Parties that have an individual share of international aviation activities in RTKs in year 2018 above 0.5 per cent of total RTKs or whose cumulative share in the list of States from the highest to the lowest amount of RTKs reaches 90 per cent of total RTKs.

   Least Developed Countries (LDCs), Small Island Developing States (SIDS) and Landlocked Developing Countries (LLDCs) are granted exemption, unless they volunteer to participate in this phase i.e. PNG.

What do airlines participating in CORSIA need to do?

Essentially, airlines participating in COSRIA will have to be required to purchase carbon offsets from other sectors to compensate for any increase in their own emissions during 2021-2035 when compared to their emissions baseline set for 2020. As of April 2019, ICAO was still yet to prescribe the exact standards which could be used to accredit CORSIA "eligible emissions units" (carbon offsets) though its Technical Advisory Body has prescribed a set of criteria which will apply when choosing standards in the future. Independent experts believe that the CDM will form the basis for

the NMM (with stronger rules around financial "additionality"), with the NMM being the new UNFCCC standard to issue CERs, which would in-turn be the only eligible offset type for use under CORSIA. Other experts suggest that Verified Emissions Reductions (VERs) issued under the Verified Carbon Standard (VCS) and Gold Standard (GS) may also be eligible under CORSIA.

Alternatively or in combination with carbon offsets, airlines may choose to use low-carbon "CORSIA eligible fuels". What constitutes an eligible fuel under CORSIA is still being debated, however fundamentally, any fuel will need to not only have a climate mitigation benefit but also broader sustainability benefits and environmental protections i.e. biofuels must not result in deforestation.

How much climate finance will the CORSIA deliver?

According to modelling by the US Environmental Defense Fund (EDF), global demand from CORSIA eligible carbon offsets is estimated to be around 2.5-2.7 billion tCO2e,[83] with wide price ranging from $3.7/tCO2e to $33.9/tCO2e in 2020 (rising 5% per year afterwards). CORSIA is likely to deliver at least $40 billion in climate finance – a significant opportunity to support climate mitigation (including sustainable land management) projects around the world.

CORSIA represents a potentially substantial opportunity to fund sustainable land management projects (including those that result in REDD+ outcomes) in PNG through creating demand for locally generated carbon offset units, and in so doing, meet NRS and other targets, and providing important social and environmental co-benefits. There are potentially two relevant sources of demand for PNG carbon offsets: 1) through national airlines (e.g. Air Nuigini) who should/wish to support domestic carbon offset projects nationally; and 2) international airlines (e.g. Qantas) who wish to support projects in PNG due to the carbon offsets being cheaper than in their home country (or elsewhere in the Pacific and beyond), and/or for corporate social responsibility reasons. A key area of uncertainty is what eligible carbon offset certification standard/s (e.g. VCS, CDM, Gold Standard) ICAO will allow for CORSIA – this is stalling investment in carbon offset projects globally i.e. if a project is developed under a standard that is not eligible under CORSIA, any carbon units generated will be effectively disqualified from use by complying airlines.

Type/s of finance	Carbon offsets (performance based) Investment in real assets (through demand for sustainable aviation biofuels)
Potential funding amount	Significant
Finance priority for PNG	Top priority
Steps to unlock finance	Establish required MRV systems for PNG's airlines – important for understanding the potential domestic demand for carbon offsets, and as required by ICAO to comply with the Pilot Phase of CORSIA. Educate airlines on the opportunities for them to buy carbon offsets from PNG-based projects.

National and sub-national compliance carbon markets

According to the World Bank's most recent statistics, there are currently 57 mandatory carbon pricing compliance schemes implemented (or schedule for implementation) around the world. This includes 29 jurisdictions with a carbon tax, and 28 with an ETS. There are a further 18 carbon pricing schemes that are under consideration.

Unfortunately, most of these compliance schemes have ruled-out international carbon credits as an eligible form of compliance for their relevant covered entities. The key reason for this is that national governments are preferencing carbon offset projects (and the associated economic benefits) to happen domestically.

Only the Korean ETS currently provides the flexibility for liable entities to offset their emissions through buying international credits from projects in developing countries, such as PNG. There are also strict rules on the use of international carbon credits if they do, including only allowing the surrender of CERs generated after 1 June 2016 from international CDM projects developed by Korean companies are allowed (with minimum ownership ratios) and only allowing entities to offset up to 10% of its compliance obligation (of which up to only 5% can come from international offset credits). The total expected demand from the Korean ETS for international carbon credits is expected to be just 16 million tCO2e.

Despite this lack of demand for international carbon credits in existing national and sub-national carbon markets, there have been some interest for proposed schemes. Australia's National Energy Guarantee (NEG), for example, was on the verge of proposing the purchase of international carbon credits to meet its 2030 NDC under the Paris Agreement. The NEG was abandoned due to the lack of partnership in late 2018, however the Labour Government has stated that if it wins government in May 2019 it will reinstate the NEG as its preferred climate change policy.

Due to rules dictating the use of domestic carbon offsets, there is currently very low demand for international carbon credits from national and sub-national compliance carbon markets around the world. This potential source of finance is not currently a priority for PNG, however developments in Australia (for example) may open the opportunity for PNG to supply it with carbon offsets to meet its 2030 NDC. This opportunity also depends on the details of Article 6 (NMM) which are being finalised as part of the Paris Rulebook.

Type/s of finance	Carbon offsets (performance based)
Potential funding amount	Currently low
Finance priority for PNG	Low priority
Steps to unlock finance	Establish systems (e.g. national carbon accounting and reporting framework, and carbon offset registry if required) for nesting UNFCC compliant carbon offset standard projects (e.g. CDM/NMM) in PNG's national carbon accounting framework, so carbon offset projects can be more readily developed in PNG.

5.3.2 Voluntary carbon markets

Voluntary carbon markets operate outside of the compliance carbon markets (e.g. EU-ETS, UNFCCC). In voluntary carbon markets individuals, organization, and companies purchase carbon offsets to *voluntarily* offset their emissions i.e. they are not required to do so by law. Offsets created in the voluntary carbon market are referred to/denominated as Verified Emissions Reductions (VERs) or Verified Carbon Units (VCUs), depending on the standard under which they were issued.

In 2017 the voluntary market transacted 63.4 million tCO_2e at a value of $191 million, an average price of $3 per tCO_2e. Prices varied widely from project to project however - from just $0.5 to over $50 per tCO_2e. REDD+ projects commanded an average price of $4.2 per tCO_2e.[84] The voluntary carbon market however remains a "buyer's market "with significantly more supply than demand -

while 63.4 million carbon credits were transacted, project developers reported having 56.2 million unsold credits on their portfolios.[85]

Voluntary carbon credits are generally issued, tracked and retired through the Markit Registry. There are a few standards under which VERs/VCUs can be issued, and which are relevant to PNG. These are:

Verified Carbon Standard (VCS)

The VCS (now owned by VERRA) is the major voluntary carbon market standard globally, based on both number of projects registered and carbon credits issues – it has certified at least 50 per cent (1300+ certified VCS projects, 200 million Voluntary Carbon Units or VCUs) of all voluntary carbon offsets to date. Under the VCS, tradable VCUs which are recorded and tracked in the Registry. Transaction costs are generally considered high in the VCS, however for bespoke projects that can demonstrate environmental and social "co-benefits" can earn a substantial price premium.

There is just one VCS project in PNG – the April Salumei REDD project[86] in East Sepik Province, which is aiming to preserve 600,000+ acres of land and biodiversity. The project was also certified under the Climate, Community & Biodiversity Standards at the gold level for exceptional biodiversity benefits (however validation expired 12 June 2016). The benefit sharing system dictates that 60% of revenue from the sale of VCUs goes to the local community via the April Salumei Working Group who decides (on behalf of the represented Incorporated Land Group) what the funds should be spend on e.g. hospitals. The project document originally estimated that 1 million VCUs would be issued annually, however since the project was registered in 2014 just 587,000 VCUs had been issued in total. Qantas has been one of the largest buyers of carbon offsets from the April Salumei project – VCUs are retired as per the demand from customers who can voluntarily "tick a box" to offset their flight when purchasing an airfare.

Jurisdictional and Nested REDD+ (JNR)

One of the key issues in developing sub-national REDD+ projects in many developing countries, including PNG, is how to credibly "nest" a project within a national GHG emissions inventory in order to keep track of any leakage that may occur i.e. logging happening in another location to what was original proposed and that is now a REDD+ project (therefore with emissions occurring regardless, just in another location).

As most voluntary REDD+ projects are accredited under the VCS, VERRA's JNR[87] was developed to provide a robust and transparent way to account for and verify approaches for the integration and scaling up of government-led and project-level REDD+ activities. The JNR provides guidance on 3 key elements required to nest REDD+ projects: 1) Accounting methodologies (No-permanence risk tool and leakage tool); 2) Independent auditing (where JNR programs seeking to issue VCUs must follow the validation and verification assessment process, including an audit by an accredited, independent third party and expert panel); and, 3) A standardised Registry System (based off the VCS registry, with safeguards to prevent double-counting).

The SD VISta Program

Another complementing scheme to the VCS, VERRA's Sustainable Development Verified Impact Standard (SD VISta) Program has been designed as a flexible framework, which provides the rules and tools for assessing and reporting on the sustainable development co-benefits of project-based activities (including under the

VCS), with the aim of helping unlock new sources of finance (e.g. private sector impact investment) to support and scale up high-impact efforts. Under the framework, methods set out the assumptions, parameters and procedures associated with measuring, monitoring and reporting of the specific sustainable development benefits which can be utilized as SD VISta assets. They also provide detailed procedures for *quantifying* the *real* environmental and/or social benefits of the project and provide guidance to help project developers determine project boundaries, set baseline scenarios, monitor the benefits and ultimately quantify the sustainable development benefits as assets. Currently in the pilot stage, SD VISta and its methods are currently being trialled across a range of sixteen project types in Canada, Ecuador, Guatemala, India, Kenya, Morocco, Myanmar, Nepal, South Africa, UK and Zambia.

Climate, Community & Biodiversity Standard (CCBS)

Yet another standard under the VERRA brand, the Climate, Community & Biodiversity Standard (CCBS) are used to readily identify land management projects (including those accredited under the VCS) that simultaneously address climate change, support local communities and smallholders, and conserve biodiversity. Essentially, for VCS projects, the CCBS represents another level of certification which identifies those projects which offer the highest-sustainability standards. In some instances, this can attract a higher price premium for VCUs that are CCBS certified and/or open new markets through providing a higher level of reputational risk protection due to the project's environmental and social benefits being verified by an independent 3rd party. Until 2016, the April Salumei VCS project was CCBS certified – this is the only project in PNG to be CCBS certified.

Gold Standard (GS)

Like the VCS, the Gold Standard is a globally recognised framework for the developing and certifying carbon offset and other environmental market (e.g. water) focused projects. Under the Gold Standard, VCUs are issued. Around 1,4000 Gold Standard projects have been certified. There are two Gold Standard projects registered in PNG – the Kumnago POME Methane Capture Biogas Project (which has been issued with 45,000 VCUs – that last of which were issued in 2013, with 0 VCUs retired), and the Mosa POME Methane Capture Biogas Project (which has been issued with 55,000 VCUs – that last of which was issued in 2013, with 0 VCUs retired). Both these projects involve using biogas anaerobic treatment processes to capture methane from waste palm oil, and then combusting it in an engine to produce electricity. There is no REDD+ projects developed under the Gold Standard, however Gold Standard has been used to provide a higher-level sustainability certification of CDM projects.

Plan Vivo

Plan Vivo is another smaller voluntary carbon offset standard, which is focused on ecosystem restoration, sustainable land management and economic development for small landholders. Only 3.1 million carbon credits have been issued under Plan Vivo, however all of these credits have been used to conserve (e.g. REDD+) and restore around 160,000 hectares of native forests and grasslands (allowing for agriculture and forestry where appropriate).

Clean Development Mechanism (CDM)

It is worth noting that CERS from CDM projects do not necessarily need to be used by liable entities / countries under the UNFCCC or national compliance schemes. CERS are often used to make voluntary carbon reduction / neutrality claims, and as noted above, can be certified

to a higher sustainability standard via using other standards e.g. the Gold Standard (though this then makes for high transaction costs when two levels of certification are undertaken).

The future of voluntary carbon market trading volumes and prices, especially since the signing of the Paris Agreement, has become somewhat uncertain – whether the VCS, Gold Standard or other voluntary carbon market standard can be used to certify carbon offsets that are eligible under the UNFCCC's NMM and ICAO's CORSIA remains to be determined. Regardless, history suggests that both compliance (e.g. CDM) and voluntary (e.g. VCS) carbon markets can exist side-by-side, serving two very different types of end buyers. However, a revised CDM standard (for the NMM and CORSIA) that is stronger from a sustainability, permanence and additionality perspective, may represent a threat to the VCS, Gold Standard and Plan Vivo – buyers are likely to buy NMM and CORSIA compatible credits to ensure flexibility on what purpose these can be retired for, if they offer the same sustainability benefits as other standards.

With all that in mind, it is important to note that the issues with oversupply and uncertainty of which standards will be eligible under NMM and CORSIA does not mean that voluntary carbon markets are likely to be dead in the water. In fact, there is still strong interest from the private sector to develop bespoke projects that have a strong sustainability story, and that blend carbon offset revenue streams with other finance sources to provide a genuine ROI.

For example, recently Royal Dutch Shell (Shell), in partnership with TNC, committed $300 million to invest in nature-based solutions that will reduce its carbon footprint by 2-3%.[88] This initiative will include buying REDD+ VCS VCUs from two projects: The Katingan Restoration and Conservation Project in Central Kalimantan (Indonesia) which is aiming to protect and restore 149,800 hectares of peatland ecosystems, to offer local communities sustainable sources of income while enhancing carbon stocks (estimated 7 million VCUs per annum); and, The Cordillera Azul National Park REDD+ Project in Peru, which aims to avoid deforestation of lowland and montane forests and allow and-use management compatible with conservation.

More details on this project and other developed Althelia Fund's project are summarised below – both are like what is being proposed by the RFIP for PNG and could be considered as a model as to how such projects could be developed in PNG.

The Cordillera Azul National Park REDD+ Project

The Cordillera Azul National Park REDD+ Project in Peru provides an interesting case study of how voluntary carbon markets can be blended with other financial instruments to achieve financial viability. There are obvious parallels with PNGs situation. The Cordillera Azul area supports a rich ecosystem of indigenous biodiversity, high carbon stock forests and a multicultural population of more than 250,000 people organized in 400 communities living in the buffer zone (2.5 million hectares) around National Park (1.6 million hectares) boundaries. There is almost no formal economy, aside from subsistence agriculture in the buffer zone, namely cocoa and coffee, which is heavily relied on by small farmers and local communities. The poverty rate us over 40%, double the national average. The project was designed as a Private-Public-Partnership between the Peruvian state (national park service) and the Althelia Climate Fund.

The phased finance structure is as follows:

1. The Althelia Climate Fund initially provided a $12 million concessional loan (over 6 years) for the protection and management of the Cordillera Azul landscape to CIMA (a leading local NGO, who - critically - holds an agree with the National Authority for Protected Areas in Peru to do so) through activities such as enhanced surveillance, biological monitoring, research, institutional strengthening and governance of communities living in the buffer zone as well as the

development of sustainable economic activities to boost their quality of life and generate sustained income in clear harmony with the protected area;
2. The Project prioritises the restoration of degraded lands in the buffer zone (created by the Peruvian Government) with sustainable agroforestry systems that combines food crops to enhance food security (i.e. banana, cassava), with sustainable cash crops such as cocoa and coffee to support poverty reduction, in partnership with local farmer cooperatives; and
3. Althelia Climate Fund then makes a return from the sale of VCS and CCBS certified REDD+ VCU carbon credits. The project is projected to issue approximately 20 million VCUs between 2015 and 2021, for which Althelia has secured buyers for (voluntary and pre-compliance).

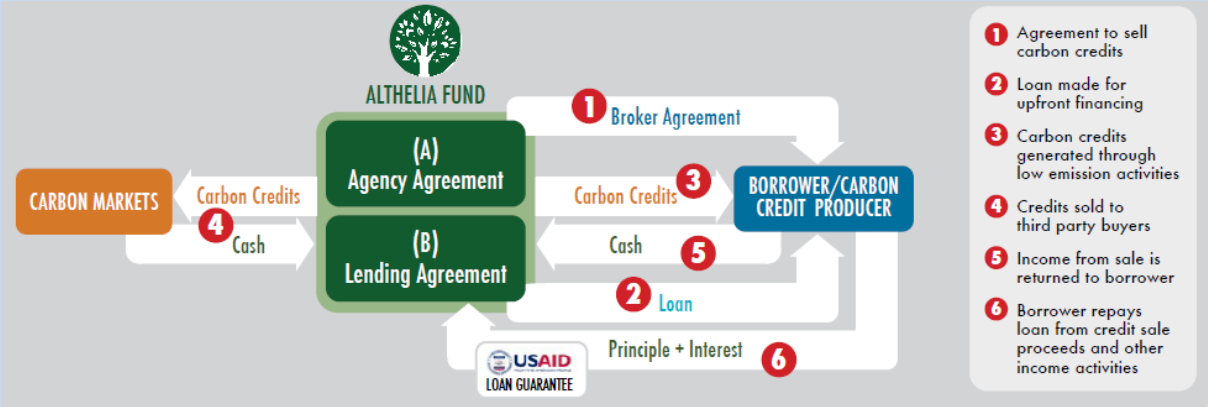
Tambopata-Bahuaja REDD+ and Agroforestry Project

Like the Cordillera Zul project (see above), Althelia partnered with the Peruvian government and a Peruvian NGO (Asociación para la Investigacion y Desarrollo Integral or "AIDER") to structure an innovative blended finance project (public and private sources) in the Madre de Dios region to conserve and restore 570,000 hectares of native Peruvian rainforest. It also includes finance to support the restoration of degraded land, and development of sustainable cocoa businesses for local communities. One of the greatest environmental and social threats to this region is illegal gold mining and other related illegal activities (such as fuel-smuggling, prostitution and liquor distribution), which create profitable and easy to earn economic alternatives that deter local farmers from engaging in legal activities such as cocoa production, which demand hard work, skills and are prone to droughts, flooding and pests.

<u>The finance structure for the first phase of this project is summarised in the text and diagram below:</u>

1. Althelia provided a $8 million low-interest loan to AIDER (6-year term, 2014-2020), with a three-year grace period in respect of capital and interest repayments. The loan is forwarded over two periods – $5 million from 2014 to 2017 to support restoring 1,250 hectares of degraded agroforestry systems and establishing a sustainably shade-grown cocoa production smallholder farm system (including drying and processing facility) in the national park buffer zone; and, $3 million from 2014 to 2020 for operational expenses related to administration, control and surveillance associated with protecting and managing the national park.
2. Loaning over these two periods allow for the marketing of "deforestation-free," fine & flavour, organic, fair-trade-certified cocoa products, with associated improvements in the livelihoods of 350 smallholder families. A small grant of $60,000 from Peru's Ministry of Environment (MINAM) has been given to the newly formed cocoa producers business cooperative (COOPASER) to establish a cocoa quality control lab within the cocoa fermentation and drying facilities financed by Althelia.
3. Loan repayments are made through several revenue streams, including the commercialisation of environmentally certified agroforestry products (more) and VCS certified VCUs. Regarding the sale of products (e.g. Fairtrade beans to chocolate bars, 150kgs already produced), under a revenue sharing agreement between COOPASER and AIDER, AIDER will receive from COOPASER, annually, the equivalent to 1.5% of sale proceeds to support conservation in the two protected areas, thus contributing to the financial sustainability of the Tambopata National Reserve and the Bahuaja-Sonene National Park (and pay back of Althelia's loan with interest). Over its first crediting period of ten years (2010-2020), the protection of native forest is expected to result in the issuance of 4 million REDD+ VCS and CCBS (gold) certified VCUs (through avoiding the clearing of 12 million hectares of native forest), with the target to be sold in pre-compliance/compliance markets.
4. Under a joint venture agreement between AIDER and COOPASER, all COOPASER members receive an in-kind package of farming inputs valued at US$2,000/hectare, which is distributed over the course of three years. The package is comprised of around 1,000 fine cocoa seedlings, high quality grafting materials, 1,000 banana suckers, 70 timber species, fertiliser and farm tools. AIDER also provides technical assistance and a variety of post-harvest services e.g. processing, and routes for export. This eliminates the risk of farmers using funds for other purposes.

5. To reduce private investment risk further, the USAID Development Credit Authority guaranteed private investors in Althelia Climate Fund (including the Tambopata-Bahuaja project) up to 50% of the fund's performance on a portfolio basis, reducing the risk of the project substantially.



The project is not without its challenges. The lack of land titling is a significant issue (as it is in PNG). Other challenges include relatively small working capital reserves of smallholder farms, a lack of diversification of crops (i.e. a need to go beyond Cocoa), lack of business / management skills, a limited supply of fine & flavour cocoa genetic material and seedlings, illegal gold mining, and market constraints including finding buyers for carbon credits. Despite these challenges, in late 2017 AIDER announced jointly with Althelia, the National Forestry Agency of Peru (SERFOR) and the Minister of Agriculture of Peru, that a milestone of 1 million cocoa trees were planted by the Tambopata Project.

Though voluntary carbon markets are facing some considerable uncertainty, the private sector still has strong interest for the "right" projects that tell a strong environmental sustainability story and that is relevant to a corporation's social responsibilities plans i.e. Shell's recent purchase of a large volume of offsets. Several private investment funds, such as Althelia, are also blending carbon offset revenue with other finance sources to build sustainable business models that achieve both REDD+ and sustainability benefits. Some investors are also looking to the voluntary market for credits for pre-compliance purposes – that is – taking a gamble on buying relatively cheap VCUs *now* in anticipation that these credits will be eligible (and thus more expensive) for compliance purposes *later* under UNFCCC/ICAO markets.

If PNG wants to be a player in these markets, it is important that PNG positions itself to be ready to sell into these markets ASAP. Failing to do so will see capital flow to other pacific nations that are ready first. One of the biggest barriers to doing so is nesting VCS and other voluntary standard certified carbon offset projects under national GHG accounting frameworks to maintain credibility of any carbon reductions through factoring leakage and double accounting. Having said that, VCS projects have already been operationalised (April Salumei), setting a precedent and signal to investors that it can be done. Ultimately, GoPNG needs to make a public decision whether this is acceptable at the national level and make efforts to account for the GHG reductions resulting from these projects. The VCS JNR makes some contribution as to how this can be resolved, and any carbon credits can be issued in the VCS and other Markit registries.

Type/s of finance	Carbon offsets (performance based)
Potential funding amount	Moderate
Finance priority for PNG	Medium priority
Steps to unlock finance	Establish systems (e.g. national carbon accounting and reporting framework, carbon offset registry) for "nesting" voluntary carbon offset standard projects (e.g. VC) in PNG's national carbon accounting framework, so carbon offset projects can be more readily developed

	when the time is right. GoPNG to work with NGOs to assist local business and community groups to identify potential REDD+ projects, consider approaching specialized carbon funds, such as Althelia, on blended and community development-focused finance structures e.g. use of credit guarantees, concession loans, carbon credits, product certification. GoPNG to advance ways to better enforce contracts and provide grievance processes to mediate issues between local communities and investors. Consider approaching large companies operating in PNG (such as those in its extractive industries, and its airlines) to be potential contracted forward buyers of carbon credits from PNG projects for voluntary / pre-compliance / compliance purposes.

5.3.3 Impact investment in real assets

Impact Investing includes investments in real assets (e.g. forestry and agricultural land, water rights) that combine financial returns with social and/or environmental benefits. Impact investing involves investing in organisations, projects or funds with the intention of generating verifiable social and environmental outcomes, in combination with an acceptable financial return. The impact investing sector is expected to grow tenfold from $77 billion in 2015 to about $700 billion by 2020 (amounting to $500 billion at the end of 2018)[89], and with it, opportunities to increase sustainable land management and conservation finance flows through investing in real assets – that is, tangible assets such as sustainable timber plantations, agricultural lands, fisheries and even water rights[90,91]. This growth in impact investing is being driven in-part by large multilateral targets such as the GHG mitigation goals of the Paris Agreement on Climate Change and the Sustainable Development Goals (SDGs), a global agenda signed by 193 Member States to end poverty by 2030 (and achieve progress on underlying drivers e.g. biodiversity conservation) has spurred business to deepen its investment in business models that do less social and environmental harm.[92]

Impact investing is a nascent (new) concept in the South Pacific region, and therefore holds significant potential for diversification and growth.[1] The region has traditionally relied on philanthropy and grants to achieve sustainable outcomes; but there are untapped possibilities for impact investing especially in the areas of sustainable land management (sustainable agriculture and forestry), aquaculture, eco-tourism, microfinance, manufacturing and renewable energy.[1] For the years 2013 to 2018, the impact investing market in Asia Pacific has been the fastest growing of the global impact investing markets.[1]

While impact investing in the Asia Pacific has previously been dominated by North American and Western European investors, local investors are increasingly getting involved, with family offices and high net-worth individuals taking the lead, followed by foundations. Various Asia-Pacific based foundations are looking to impact investing, and its scalability. Many of these foundations are utilising loans, equity, concessionary loans and social impact bonds to bring impact investing to the Pacific; and are promoting partnership building to increase funds and scale up the impact. Impact investing can be beneficial for small to medium enterprises in developing countries which have had limited access to financing.[74]

Major private investors in impact investing in the Pacific currently are: Christian Super, QBE, Hesta, LeapFrog, Optus, NAB and NatureVest; whereas public or development agency investors are the Australian Government, World Bank, United Nations and the Organisation for Economic Co-

operation and Development.[50] There are numerous intermediary organisations involved in facilitating and connecting investors with impact investments in the Pacific, such as: Pacific Readiness for Investment in Social Enterprise (Pacific RISE), Secretariat of the Pacific Regional Environment Programme, Pacific Trade Invest, Coffey International Development, Impact Investing Australia and the Criterion Institute. [1] [50]

The Pacific has seen low levels of economic growth over the past years and impact investing offers an opportunity to foster economic growth while reducing the land degradation issues faced by many island nations through investment in SLM practices.[1] PNG is currently receiving impact investing funds from the Climate Investment Fund which have invested $30 million in grants and near-zero interest loans; these have funded vulnerability assessments, adaptation plans, sustainable fisheries, climate proofing of infrastructure and food security measures.[1]

This approach brings an environmental sustainability lens to timber and agricultural production, and creates favourable risk and return conditions to assist these investment approaches in being competitive with conventional, often environmentally degrading, approaches to forestry and agriculture.[91] This is done through: the sale of conservation covenants, mitigation and offset credits; certified sustainable timber and agricultural practices and harvests; and, low interest debt and tax incentives.[91] These provide low cost capital and diverse income streams and therefore can create both economic and environmental capital that can improve the risk-return profile of these investments.[93] [91] According to The Global Impact Investing Network's 2017 Annual Impact Investor Survey, sustainable real assets account for 22% of impact investing, which indicates that there is investor interest in sustainable real assets. [94] [95] Frameworks and standards that facilitate impact investing in real assets, such as sustainably managed forests and fisheries, allows investors to invest with more certainty and reduced risk. [96]

Responsible management of natural resources and improvements in environmental conditions can ensue due to sustainable management of real assets. [97] An example of a sustainable land management real asset may be an agricultural farm's conversion to organic farming practices which may create increased short-term financial costs but provide improved soil fertility and garner price premiums for organic produce in the future.[97] In 2017, Sonen Capital closed their first 'sustainable real assets fund' after its creation in 2014 and raised USD 75 million to be invested in sustainable real assets; indicating that substantial amounts of money can be procured for sustainable land management projects through investment funds. [98]

Impact investing is not just about funding projects that generate verifiable environmental and financial returns, but also those that have social and cultural returns, and therefore meet multiple SDGs. For example, there is a substantial opportunity to conserve and restore land that generates carbon revenue, while also enhancing the health of environmental assets that have important cultural significance for PNG communities.

Sustainable land management aims to increase the productivity of lands used for agriculture and forestry while preserving ecosystems and their services through the following practices: preventing land conversion; preventing soil degradation and erosion; improving water quality and quantity; promoting better soil, crop and water management; promoting agroforestry; rehabilitating degraded environments; and, managing soil salinity.[99] [100] Impact investors seek investment opportunities in sustainable agriculture and forestry as they provide inflation protection, diversification and have established (making economic returns more likely and reliable).[101] [102] Sustainable land management practices can safeguard and enhance agricultural and forestry production to payback investors; sustainable land management technologies combat land degradation, and sustainable land management practices can assist in providing sustainable livelihoods and increasing food and income security which in turn increases the quality of life for locals. [40]

Importantly, impact investing is increasingly relying on third-party certification standards, such as the Forestry Stewardship Council (FSC) or VCS, to provide a standardised framework by which to

quantify and verify the environmental and economic outcomes of a good or service. These frameworks also attempt to value and incorporate the ecosystem services of a good or service into its market price. Certification can be undertaken internally within an organisation or project, or externally by a third party, and can be used across various investment instruments and can hold differing processes or principles; ensuring the certification standard is appropriate to the line context to produce accurate findings.

Third-party green product and service certification programs can be applicable to whole supply chains, specific procedures or practices and involve assessing, measuring and monitoring procedures, practices or outcomes against the relevant externally set requirements of the certification standard. Non-compliance results in no certificate being issued.[103] Through third-party verification, the reliability, accuracy and credibility of the certification standard and the environmental activity undertaken is guaranteed - this is especially important for consumers and shareholders who use certification standards to determine which businesses, goods or services they wish to support.[104] Certification effectively acts as a guarantee to stakeholders that the business or activity is producing verified environmental benefits.

Third-party standards and certification schemes most commonly used in conservation investments are in the areas of carbon offsetting and sustainable forestry and agriculture. For example, over 180+ million hectares of forests worldwide were managed according to Forest Stewardship Council (FSC) standards at the end of 2014. This includes boreal, temperate and tropical forests, owned publicly, privately and by communities.[105] Certification schemes also cover agriculture, tourism and other sectors. Surveys also suggest that around 75% of investors are motivated to use certification schemes due to legal requirements.

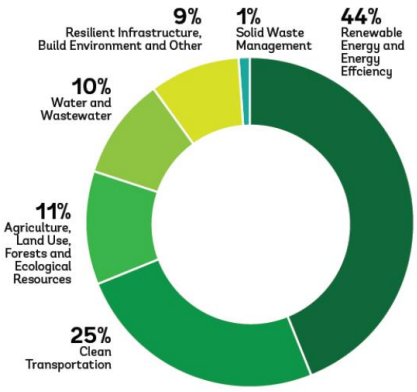
The growth in impact investment represents a very significant opportunity for PNG, which can meet multiople objectives. However, it is currently not ready to support investors to develop projects in country. Key missing ingredients include: an opaque/lack of project pipeline, weak enforcement of contracts, lack of standards around sustainable forestry and agriculture, lack of data, and other issues commonly associated with performance-based payments (i.e. carbon offsets).

Type/s of finance	Debt (loans) and equity (investment).
Potential funding amount	Significant.
Finance priority for PNG	Top priority.
Steps to unlock finance	Establish systems (e.g. national carbon accounting and reporting framework, carbon offset registry) for “nesting” voluntary carbon offset standard projects (e.g. VCS) in PNG’s national carbon accounting framework, so carbon offset projects can be more readily developed when the time is right. GoPNG to work with NGOs to assist local business and community groups to identify potential sustainable land management projects, consider approaching specialized carbon funds and intermediaries, such as Althelia, on blended and community development-focused finance structures e.g. use of credit guarantees, concession loans, carbon credits, product certification. GoPNG to advance ways to better enforce contracts and provide grievance processes to mediate issues between local communities and investors. GoPNG to work with NGOs to assist local business and community

	groups to identify potential REDD+ projects, consider approaching specialized carbon funds, such as Althelia, on blended and community development-focused finance structures e.g. use of credit guarantees, concession loans, carbon credits, product certification. Making available a full range of credit enhancement tools to help mitigate project risk. PPP's via an environmental trust fund would also be helpful.

5.3.4 Green Bonds (including Climate Bonds)

A green bond is a form of debt finance or debt security issued to raise capital specifically for climate change or environmental related projects. Green bonds provide investors with an attractive investment proposition and an opportunity to support climate friendly and environmentally sound projects.[106] It is issued by both the private and public sectors.



Essentially, green bonds have the same financial structure as traditional bonds, namely they are a way for an entity to raise capital by borrowing money from other entities on the basis that they money will be repaid with a fixed amount of interest (i.e. 'the coupon rate'). Green bonds are defined as a bond where proceeds are utilised for financing environmental investments, projects or activities[107]. The green bond market was established in 2007, with issuances growing to over USD 155 billion in 2017 (a 78% increase on 2016).[108] [109] Investors are starting to think long-term about climate change impacts, and thus are turning to green bonds as an investment strategy.[110] Currently, majority of green bonds are issued by governments, multi-lateral entities or corporations and are used to fund projects related to renewable energy, green buildings and other low-carbon projects – see inset (Source: World Bank).[111]

There are numerous sub-categories of green bonds such as green project bonds, green property bonds, green covered bonds, forest bonds, climate bonds, marine protected area bonds, conservation impact bonds, Blue Bonds and Environment Impact Bonds. Many of the models rely upon government involvement, either through government underwriting (e.g. expectations of future public health or environment savings), or in creating markets through regulation. All have similar financial structures, with the main difference between them being the specific types of environmental investments they fund.

One important component of green bond issuance is determining what a "green bond" actually is. Like for other certified products, this requires standards and criteria, so that investors can compare the advantages and disadvantages of one "green bond" to another "green bond". The Climate Bond Initiative is developing new criteria in land conservation and restoration.[112] Other standards and criteria are being developed by the International Capital Market Association's Green Bond Principles (GBP) and under the ASEAN Green Bond Standards (AGBS).

Green bonds have not been used widely to directly fund conservation (including REDD+) or other sustainable land management projects around the world, as the main challenges in doing so are generating and quantifying financial returns and achieving scalable impact investment opportunities. Having said that, an example of a green bond being used to fund land conservation is the world's first forest bond that was issued by the IFC in 2016, and which was backed by large-scale investors such as BHP Billiton.[113] This bond raised $152 million and was aimed at increasing private sector investment in sustainable forestry and the REDD+ program.[114] Repayment of this bond will include

the issuing of carbon credits generated from avoided deforestation to investors, where BHP Billiton have announced they will purchase a total of $12 million credits.[115] [114]

While green bonds focused on conservation and sustainable land (and marine) management currently provide a relatively low rate of return versus other project types, these rates are likely to increase as suitable criteria is published, investors become more experienced with such instruments and more potential projects become available.

Green bonds in the Pacific

Green bonds have not been widely used in the Pacific. In 2017 Fiji became the first emerging economy to issue a USD50 million sovereign green bond, which will fund projects to help the country adapt to a changing climate. The participation rate recorded in the tender was three times the rate normally associated with Fiji Government Infrastructure Bonds, with the first round of funding being used to fund climate change adaptation projects and environmental programs, including the replanting of coastal wetlands. Fiji's Green Bond Framework targeted key areas including climate change mitigation and adaptation, sustainable land use and biodiversity protection. The framework was created to portray transparency, disclosure, integrity and quality to demonstrate how Fiji will issue its green bonds. Sustainalytics, an independent Environment, Governance and Social research and ratings company was hired for the Second Party opinion and to validate the framework for its sustainable and green qualities as well as its alignment to the Green Bonds Principles (GBP). A breakdown of how the Fiji Green Bond proceeds were spent (in addition to the returns and other key information) is provided below and are compared to PNG's 2018 Sovereign Bond. Also highlighted are the details of the Seychelles Blue Bond, which include a relatively low rate of return which has been raised through a GEF subsidy and guaranteed by the World Bank to reduce the risk.

	PNG Sovereign Bond	Fiji Sovereign Green Bond	Seychelles Blue Bond
Issued	October 2018	October 2017	October 2018
Size	$500 million	$50 million	$15 million
Interest	Well-subscribed	Over-subscribed	
Term	10 years	13 years	10 years
Yield	8.4%	Two tranches, 4% then 6.3%	6.5%, subsidized (2.8%) by GEF funding and guaranteed by World Bank
Rating	Sub-investment grade (B) – S&P, B2 Negative - Moody's	N/A	N/A
Usage	China debt refinancing, costs of hosting APEC	Approx. $5 million for rural water supply systems, $40 million for cyclone recovery, $3 million for rural solar electricity connections, $1.5 million waste management, $0.15 million for REDD+[116]	Marine protected areas and sustainable fisheries

Green bonds are feasible in a high liquidity country like PNG, and a good option to attract private sector investment in climate change activities. However, like for other debt instruments, PNG's credit rating is a major challenge in this respect. Having said that, in 2018 its plain vanilla Sovereign Bonds were well subscribed (though this was likely due to the US being motivated to re-finance

Chinese debt for both financial and geopolitical reasons). Pairing green bonds in PNG with subsidies returns and loan guarantees is a string option for mitigating the impact of PNG's poor credit rating. Furthermore, green bonds can also be paired with performance-based payments, such as from carbon offset projects.

Type/s of finance	Green bond (debt).
Potential funding amount	Significant.
Finance priority for PNG	High
Steps to unlock finance	GoPNG to work with NGOs to assist local business and community groups to identify potential sustainable land management projects, consider approaching multilaterals (e.g. World Bank) and specialized carbon funds and intermediaries, such as Althelia, on blended and community development-focused finance structures e.g. use of credit guarantees, concession loans, carbon credits, product certification in combination with green loans. GoPNG to advance ways to better enforce contracts and provide grievance processes to mediate issues between local communities and investors.

5.3.5 Philanthropic donations by companies and individuals

Outside government, philanthropic donations can be provided by both organisations (often private corporations) and individuals. Corporate Social Responsibility (CSR) generally involves a voluntary effort by a corporation to assess and take responsibility for its environmental and/or social impacts. This includes providing finance for local environmental and economic development projects, with the intention of enhancing the corporation's social licence to operate, particularly with local communities where it may have a project in development. For example, New Crest Mining providing education, power and medical facilities for the local community on Lihir Island. Corporate donations have also been mandated by government - In 2014, India enacted a law requiring businesses with annual revenues of over $175 million to give away 2% of their net profit to charity. By 2016, several reports had estimated that annual CSR / charitable spending in India had increased from around $700 million to approximate $5 billion. Arguably, other companies (such as Qantas and Shell, as noted in the section on voluntary carbon markets) have invested in high-risk, low-return projects to gain CSR recognition with local communities and customers.

Individual monetary gifts are a long-standing form of support for projects that often do not offer a rate of return and are often, but not always, made in anticipation of an income tax deduction. A tax deduction may not be sought by some high net worth individuals (who have at least $40 million), and individuals who provide donations via a charitable bequest i.e. when an individual/s may elect to transfer part of their estate to benefit conservation in the event of their death via a legal will. Recently, there has been a rise in ultra-high net worth individuals, especially younger wealth (early 30s and 40s) who want to make a results-based philanthropic impact, including funding new technologies and innovative solutions to the planet's key environmental and social challenges. Ultra-high net worth individuals constitute just 0.03% of the global population (approximately 250,000 individuals), however hold 13% (around USD27 trillion) of the world's total wealth[117].

Like for other finance types, philanthropic donations can be used to attract other money. It is also reasonably easy to structure i.e. the money is provided with minimal strings attached (with governance that the money is being used for the stated purpose often being the most important thing for the donor). In recent years, there has been a surge in CSR and individual donations to

projects and initiatives that "do good". There is also a growing trend where donors want a financial return alongside social and environmental benefits, helping to expand the impact investing sector. Experts predict that a huge intergeneration wealth transfer will occur in the next decade, with a large increase in the number of high-net worth individuals in a younger and more environmentally-socially aware generation. PNG should not discount the opportunity that philanthropic donations could provide for REDD+.

Type/s of finance	Donation.
Potential funding amount	Low to moderate.
Finance priority for PNG	Moderate.
Steps to unlock finance	Build a pipeline of credible projects, and tap into (develop) networks of potential philanthropists. This would also be strongly tied with the provisions of impact investing.

5.3.6 Debt for nature swaps

Debt-for-nature swaps are an agreement that reduces a developing country's debt stock in return for a commitment from the debtor-government to protect nature. In exchange for debt forgiveness, the debtor-government commits to invest any savings in conservation-related expenditures. The transaction is enabled through the willingness of a creditor to pardon all or part of the debt, or to sell the debt to a third-party (for example a conservation orientated NGO such as The Nature Conservancy) at a lower price than the debt's face value. Similar swap agreements have been used to finance social expenditures, particularly in education and health.[118]

Debt-for-nature approaches to conservation finance have been around for decades. For example, in 1991 over USD 1 billion in credit owned by the US was negotiated via debt-for-nature swaps through the Enterprise for the Americas Initiative (EAI), resulting in approximately USD 200 million of direct finance transfers to conservation projects in Latin America. More recent examples include: In 2017, USD 26 million being directed to conservation projects in Costa Rica through a partnership between Conservation International, and the Costa Rican and US governments; and, a Seychelles Debt Restructuring for Marine Conservation and Climate Adaptation DNS in whereby The Nature Conservancy bought USD 22 million of the Seychelle's sovereign debt in exchange for conserving 210,000km^2 of marine area.

A UNDP survey showed that DNS are now under active discussion in a few Pacific SIDS (e.g. Palau), and are of broader interest to the South Pacific region as a tool to increase financing for environmental interventions. This includes for PNG, which has a relatively high-level government debt-to-GDP ratio of 33%. Unfortunately, discussions with the relevant financial institutions have revealed PNG to be well down the priority list of potential countries where a DNS deal could be structured – mainly due to the real and/or perceived corruption and governance issues, and due to investment criteria seeking to target economies with a government debt-to-GDP ratio of over 50%.

Type/s of finance	Debt swap.
Potential funding amount	Moderate.
Finance priority for PNG	Very low.
Steps to unlock finance	N/A.

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