

PNG REDD+ Finance and Investment Plan

Draft 22th November

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Executive Summary

PNG has the potential to achieve emissions reductions of over 17mtCO₂e per year by 2028

Achievement of emissions reductions will require a transition in the rural economy and the way that timber and agricultural production is undertaken

Action will need to be taken to strengthen the framework for REDD+ coordination, management and reporting, to improve the enabling environment for investment in 'indirect' REDD+ actions such as plantation development, conservation and sustainable agriculture that will deliver social, economic and environmental benefits while also supporting emissions reductions.

A highly conservative estimate of the costs of achieving this transition indicate that in excess of \$230m will be required in additional expenditure – equivalent to a 50% increase on existing government budgets to the target sectors.

While international REDD+ specific finance will be able to address some elements of this it will not be sufficient and it will be important to mobilise financing from multiples sources within the public system, existing development partners, philanthropists as well as the private sector to meet the investment needs.

The future nature of REDD+ specific finance is also liable to change with ongoing negotiations on the role of emissions trading under Article 6 of the Paris Agreement. As such it is pertinent of PNG to both be cautious in establishing new financing agreements prior to this and to prepare for a range of different outcomes.

Linked to this it is essential that PNG establishes a robust and transparent set of systems capable of making decisions on REDD+ implementation, monitoring and reporting emissions, providing information on safeguards and managing future REDD+ investments.

In addition development of target investment areas, projects and programmes for which baseline investment information is in place including links across sectors will be valuable in attracting early finance and rapidly scaling up investment as well as ensuring PNG is able to target investment in areas aligned to its development priorities.

PNG Context

PNG has made significant commitments towards the development of a low emissions development pathway including targets of a 50% reduction in emissions by 2030.

The recent Medium Term Development Plan 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.

Opportunities from REDD+

A mechanism on REDD+ provides an opportunity to support PNG in achieving these objectives by providing positive incentives for reductions in emissions from deforestation and forest degradation as well as the sustainable management, conservation and enhancement of forest carbon stocks.

As such it can act to help finance the transition of PNG to a low emission rural development pathway. Investments to support delivery of REDD+ results should target development of low emission

PNG's Forest Reference Level and recent update report indicate that emissions from the forest sector have averaged 39.7mtCO₂e per annum – equivalent to 8.5m cars being driven for 1 year

Prices for carbon are highly variable ranging from less than \$1 to over \$100 with average values for REDD+ credits at \$4.7.

Ongoing negotiations under the UNFCCC will decide how emission reductions can be exchanged between different groups including government to government and government to private sector. Outcomes of these negotiations will significantly impact availability of finance future markets and prices for credits

development activities that provide long term sustainable livelihoods for communities, as well as establishment of the coordination, monitoring, reporting and management systems to ensure the transparency of results delivered and the effective management of resources received.

While mechanisms exist to mobilise finance for REDD+ ongoing negotiations through the UNFCCC will have a significant impact on the scale and nature of future finance.

Progress on REDD+ in PNG

Through positive government action and international REDD+ readiness support PNG has made progress in developing key elements of its approach to REDD+ including submission of its Forest Reference Level (FRL) to the UNFCCC, launching of a National Forest Monitoring System (NFMS) portal and approving at cabinet level a National REDD+ Strategy all in 2017.

The FRL indicates levels of emissions from the forest were close to 40mtCO₂e per annum in 2013 and are predicted to rise to over 50mtCO₂e by 2020. With forest loss occurring predominantly through a trajectory of forest degradation through logging (responsible for 92% of forest degradation) followed by forest clearance for agriculture (responsible for 96% of forest clearance).

The NRS identifies a strategic approach to reducing levels of emissions and supporting removals that builds on existing government policies and programmes.

The current document provides an introductory discussion on the broad approaches available to emissions reduction (Section 1), estimates of the costs of implementing a number of these key activities as, their potential impacts and financing mechanisms (Section 2), existing and potential financing sources to support their implementation (Section 3) and an overview of how finance can be structured to incentivise action (Section 4). Some amendments to the structure of components and activities have been made in the development process – see table at the end of this summary for revised structure.

Note – the current document should not be seen as a definitive costing or financing and implementation strategy for REDD+ but a tool to strengthen further discussion on how to prioritise activities and to finance and deliver REDD+ results.

Components of the National REDD+ Strategy

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+

Sections of RFIP

Section 1. PNG Context, REDD+ Development and Existing Abatement Options
Provides an overview of existing action on REDD+ as well as levels and sources of emissions from the forest sector and high level approaches to emission reduction, their potential impacts and possible economic costs.

Section 2. Summary of Proposed Investment Areas
Provides an breakdown of proposed action areas within the NRS including outline costings and existing support to the sectors.

Section 3. Potential Financing Sources
Provides an overview of potential financing sources including climate finance, government, private sector, development partner, and philanthropic. It notes how these sources of finance can be bought together (blended) to help support implementation of activities. Note it does not provide a detailed list of all potential funders.

Section 4. Options on how to structure REDD+ finance
Provides an introduction to how finance could be utilised to incentivise action and deliver REDD+ results.

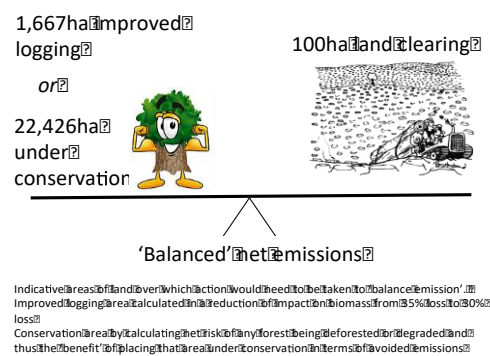
Impacts and Costs of Implementation

Implementation of key elements of the NRS could deliver emissions reductions of over 17mtCO₂e per year against 2013 levels.

Table 1: Potential Emissions Reductions through action on REDD+

Potential areas for emissions reductions	Emission reductions against 2013 levels (tCO ₂ e)
Reduced logging activities (ending of timber concessions)	9,346,425
Reduced impact of remaining logging activities -	2,732,476
Development of plantation areas	2,364,059
Reduced levels of conversion (through conservation, land use planning, improved application of environmental permits)	2,742,594
Total	17,185,555
Total 2013 emissions	42,401,717
% reduction in emissions against 2013	41%

Figure 1: Challenges of balancing emission reductions at the national scale



Such reductions will, however, require both a coherent policy approach to land use change and forestry as well as support to agricultural development to ensure that action to reduce emissions in one area is not offset by forest loss or degradation in another area (see Figure 1).

Changes in rural production approaches will also require development of sustainable zero/low deforestation enterprises that are capable of addressing demands for rural development and income generation in place of high impact activities that are reduced through implementation.

Indicative costs of implementing core elements of REDD+ coordination and management are over \$6m (Component 2) over 10 years while broader implementation of actions to deliver REDD+ results will be close to \$230m (Component 2) (see Table 2 for summary, Table 3 for further details and Section 3 and Annex 1 for more comprehensive information).

This level of spending is significantly above existing government support to the target sectors with and would represent close to a 50% increase on existing central government spending across these sectors.

Table 2: Indicative Estimates of Direct Costs of REDD+ Implementation

	Action Areas	Costs
Component 1	Development of National Sustainable Land Use Policy and Regulations and means of implementation:	11,275,740
	Enhanced assessment and monitoring of environmental permit applications	14,348,117
	Expansion of Protected Areas	18,432,667
	Strengthening Forest management and Enforcement Practices	135,515,219
	Establishment of planted timber supply	6,666,667
	Strengthen sustainable agricultural development	62,515,234
Component 2	Strengthening REDD+ coordination, monitoring, reporting and management	6,316,675
	Total	235,945,735

A reduction in logging within TRP areas in line with TRP expiry dates would result in emissions reductions of over 9mtCO₂e by 2028 if no new operations are initiated. This would equate to RBPs of \$45m but also a loss in tax revenue of over \$32m and a loss of royalties of over \$10m

Such estimates should however be treated with extreme caution due to challenges in developing effective cost estimates, significant discrepancies between some government cost estimates and those provided by projects or programmes and difficulties in identifying who would bear the costs of implementation.

Availability of Finance

PNG has the potential to mobilise considerable finance to support the delivery of REDD+ results with options for support through climate finance (both grants and results based), development partner finance, philanthropy, government support and the private sector.

Climate finance in support to REDD+ readiness and early action is in place and will continue through to 2020 through the FCPF Readiness Support project. Opportunities also exist to mobilise further finance from the Green Climate Fund (GCF) to continue development of the central elements of REDD+ (strategy, FRL, NFMS and SIS) as well as undertaking early action related to sustainable oil palm and forestry development.

Other development partner finance is and can be mobilised to support delivery of REDD+ results through both direct REDD+ related actions and indirect actions. Example projects include finance to support sustainable financing within the conservation sector (GEF6), strengthening of emissions reporting (GEF6) and work on development of environmentally sustainable commodities (GEF7). Within forestry continuation of JICA support to strengthening monitoring operations has the potential to be linked with further GCF support, although gaps exist to support ongoing development of the NFI. Within the agriculture sector large scale programmes looking at coffee and cocoa through the WB's Productive Partnership in Agriculture Programme has delivered results and has the potential to continue while further support through ICRAF and EU to cocoa and vanilla value chains can be aligned with REDD+ outcomes.

Options for results based finance for REDD+ are also significant and it is anticipated will become clearer following COP24 but may include bilateral agreements, increased finance through the GCF, options for private sector credit purchasing.

Public finance while limited has significant potential to mobilise additional development partner, climate finance and private sector investments through creation of positive enabling environment for sustainable investments. Key target areas should include plantation development, reduced impact logging in line with the logging code of practice, and sustainable commercial agricultural developments in particular for oil palm, coffee and cocoa. Investment in these areas has the potential to vastly exceed other forms of finance and can establish a key income base for rural communities as well as tax base for local and national government.

Barriers to Finance and Next Steps

Mobilising additional finance to deliver REDD+ results, while also supporting rural development faces the same challenges as mobilising finance in almost any sector in PNG. While returns on investment, in terms of emissions reductions and other environmental, social and economic benefits may be high investors are faced by a number of key challenges:

- *High risks of investment* – PNG is seen as a high risk country for investment, it ranks 109 out of 189 in the WB's ease of doing business index and challenges linked to land tenure security, policy/regulatory changes make many business reluctant to invest. These challenges are also exacerbated by potential reputation risk should investments be seen to breach international social and environmental standards.
- *Lack of market knowledge / information* – PNG is a highly remote and diverse country and creating effective links between producers of commodities, plantation development programmes or conservation activities and interested financiers at the international level is extremely difficult. This is accentuated by limited external knowledge of the PNG context and limited domestic knowledge of international market trends.
- *High costs of doing business* – PNG is a remote country with limited transport infrastructure and low capacity levels. Developing businesses that require specialist equipment and skills and getting products

to market is relatively high cost and presents a barrier to entry for many businesses and well as a barrier to small scale production approaches.

Linked to these issues the majority of investors from all sources are seeking:

- *Enhanced transparency of finance* – investors want to see high levels of transparency in how funds will be managed and spent as well as how any returns on investment will be distributed.
- *Tangible and measurable impacts* – Many investors will want to see direct relationships between spending and impact as well as impacts across a spectrum of environmental and social criteria.
- *Shared commitments and risk* – Blending of financial commitments and risk provide a strong model to increase funder confidence with programme that bring together government finance, development partner finance and private sector likely to be able to catalyse further investments.
- *Development of enhanced products and market promotion* – many investors are unaware of opportunities within PNG and may have perceptions of low quality products. Developing high quality products across all areas (carbon, timber, coffee, cocoa) that include strong co-benefits will be critical to increasing investor confidence and attracting investment into PNG.

While many of these issues go beyond REDD+ and will take significant time to address there is potential to take targeted action to address a number of areas to create an attractive environment for investment. It is thus critical that PNG works to establish:

A coherent policy approach to REDD+ - The NRS and current 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.

Strong systems for the coordination and management of action on REDD+ - strong systems for coordinating action on REDD+ including monitoring and reporting of emissions and transparent systems for the use of finance would help to provide a clear basis for investment. This should also consider how potential different scales of REDD+ implementation can be linked to ensure transparency in emissions accounting.

Development of early actions within a number of target areas – Establishment of demonstration approaches that are in line with national priorities and fit within national systems would provide a clear signal to investors on the potential for further development of REDD+ action in PNG. An example of such an approach would be development of a public, private, community partnership for plantation development.

Next Steps:

Establishment of core REDD+ architecture – this includes a National REDD+ Steering Committee and / or the National Climate Change Board to provide a location for policy discussion, ongoing strengthening of capacity to monitor and report on emissions including enhanced engagement between those working on REDD+ and mitigation policy and those working on accounting to facilitate understanding and specific areas of importance for monitoring and reporting, a robust financing management that can be utilised to manage and future RBPs as well as other central government finance, safeguards information system that is able to integrate high quality information on impacts of projects and programmes.

Further development of priority investment areas to establish a draft investment portfolio – developing a portfolio of investment areas would provide a clear system to attract additional finance. Investment areas should target thematic areas, and discrete geographical locations. The current document provides an initial step towards this but considerable additional work is required. Linked to this process identification of potential incentive systems for development of activities and management of any REDD+ results should also be developed.

Policy discussion on cross cutting issues including – a number of cross cutting issues exist that attract both international attention and present risks to any net reductions in emissions at the national level. These

include allocation of Forest Clearance Authorities and approaches to their management, targeted levels of annual timber production and the role of timber permits that are due to expire in the next decade.

Strengthen cross sector understanding of REDD+ and identify options for collaborative programming – a number of options exist for REDD+ results to be achieved through indirect activities. While many of these have been identified in the NRS and current document other opportunities exist especially linked to actions to support climate resilience through improved land use planning and agricultural practices.

Draft

Summary of Actions Costings, Impacts and Finance

XXXX – add in notes re when budget from government source

Table 3: Summary of Actions, costings, impacts and finance

Policies and Measures	Sub-actions / details	Indicative Costs	Indicative Benefits	Financing Status / Next steps
Strengthen Coordinated national and subnational land use and development planning	<p>Targets:</p> <ul style="list-style-type: none"> - Establish a national sustainable land-use planning framework - Integrate spatial plans into provincial, district and local level government (LLG) development plans 	<p>Notes on financing:</p> <p>Currently significant financing gaps, limited existing financing.</p> <p><i>Government</i> – Currently limited government finance, potential to incentivise investment within sub-national governments by linking spatial plans to release of budgets as well as incentives for maintaining levels of land cover. Also options to link with productive (e.g. requirements for agricultural/forestry developments to have more comprehensive land use plans and conservation sectors e.g. planning around CCAs)</p> <p><i>Private sector</i> – Limited options unless at specific projects sites linked to developments e.g. surrounding mines, within agricultural/ forestry production landscapes.</p> <p><i>Climate finance</i> – Options to link finance with adaptation / DRR finance. Potential inclusion in initial GCF investment finance.</p> <p><i>Development partner</i> – Potential inclusion in role out of policy, due to political sensitivity of land many donors will be cautious.</p> <p><i>Philanthropy</i> – Limited to potential specific sites linked to other primary activities e.g. conservation</p>		
Establishment of National Sustainable Land Use Planning Framework	<i>Establishment of National Sustainable Land Use Planning Framework</i> - including policy, legislation and regulations as well as capacity building and awareness raising on the revised framework.	\$996,740	Indirect benefits through improved decision making on land use	Draft SLUP developed initial support to revisions of policy under FCPF project – significant finance required
	<i>Development of a National Land Use Information System</i> – Establishment of a central spatial information system that can be utilised to provide information from across sectors and support	\$3,075,600	Indirect benefits through improved decision making on land use	Initial assessment of system needs supported by FCPF project – significant finance required

	planning. Costs include design, development and capacity building			
Development of spatially explicit subnational development plans	Integration of spatial plans within LLG, District and Provincial development plans. Costings in awareness raising, training and roll out of planning process.	\$7,203,400	Indirect benefits through improved decision making on land use	Initial testing of approaches being developed under FCPF project – significant finance required
Strengthening Forest Management and Enforcement Practices	<p>Targets:</p> <ul style="list-style-type: none"> - 50% of all concessions classified as fully legally compliant by 2024, 100% fully compliant by 2029 - 50% of small scale operations fully compliant by 2024, 100% fully compliant by 2029 - 22,000ha planted per annum, 220,000ha by 2029 - PNGFA’s capacity to provide technical support to PNG’s forest management decision making is increased 	<p>Notes on financing:</p> <p>Existing finance for NFI and support to strengthening of monitoring systems as well as development of TLS and areas of research funding. Funding gaps to achieve implementation at scale across PNG and to sustain NFI.</p> <p><i>Government</i> – High gap between income and spending on sector. Options to increase targeted spending of revenue from sector or use taxes and fees to incentivise improved practices.</p> <p><i>Private sector</i> – additional spending needed to meet standards. Options for investment in plantations sector.</p> <p><i>Climate finance</i> – Potential to link with tree planting project scale or programmatic action on revisions to logging practices. Inclusion in GCF investment proposal.</p> <p><i>Development partner</i> – Existing support from JICA and EU. Options for continued support potentially linked to targeted reforms and application of TLS</p> <p><i>Philanthropy</i> – limited options</p>		
Strengthen application of PNG’s Timber Legality Standard	<p>Action including:</p> <ul style="list-style-type: none"> - Awareness raising on standards– \$1,622,880 - Strengthening information management and monitoring systems – \$833,414 - Strengthening in field monitoring capacity – \$35,846,483 - Increasing action on forest rehabilitation – \$26,164,617 - Establishing a third party verification system - \$35,374,667 	\$98,842,060	<p>Increased global recognition of PNG timber legality increases access to markets and sustains existing market access</p> <p>Increased stocking of logged over areas due to enhanced regeneration</p> <p>Indicative emission reduction potential: 20.4mtCO₂e over 10 years</p>	<p>Ongoing target actions through PNGFA operations with additional support through JICA, RAFT and EU finance. Potential ongoing support through JICA and GCF.</p> <p>Additional finance needed to achieve full scale improvements</p>
Regulation of small-scale timber operations	<p>Actions include</p> <ul style="list-style-type: none"> - Strengthen regulation of small scale timber operations - \$1,824,460 - Strengthening capacity to monitor small scale 	\$28,382,172	<p>Increased capacity of communities to participate in timber industry.</p> <p>Indicative emission reduction</p>	No existing support

	<p>timber production \$21,721,4836</p> <ul style="list-style-type: none"> - Capacity building of small-scale operators - \$4,836,640 		potential: 0.34mtCO ₂ e over 10 years	
Strengthen timber supply from planted forests	<p>Actions to support increase in timber supply including</p> <ul style="list-style-type: none"> - Development of small-scale woodlots - Undertaking of environmental planting - Development of commercial plantations - Costing based on OPGPD cost estimates 	\$6,666,667 ¹	<p>Increased value of planted forest and high grade timber.</p> <p>Indicative emission reduction potential: 14.4mtCO₂e over 10 years</p>	Minimal financed through reforestation levee, with no central government finance. Technical support through ACAIR to woodlot development in ENB - Significant financing required
Increased capacity of PNGFA for policy development planning, training and research	Initial costing looks only at elements of policy dialogue	\$525,100	No direct impacts	Ongoing finance to policy division in PNGFA and support through RAFT and EU NFI on policy dialogue as well as NFI as well as support through ACAIR on number of research activities. – Significant support needed to maintain NFI.
Strengthen Environmental Management enforcement and protection	<p>Targets</p> <ul style="list-style-type: none"> - By 2024 50% of PNG’s concessions have fully up to date environmental management and all new concessions undergo effective environmental impact assessments - By 2029 100% of PNG’s concessions have fully up to date environmental management and all new concessions undergo effective environmental impact assessments - By 2024 – all environmental impact assessments and environmental management plans are publically available on an environmental management information system - By 2024 at least 3 provinces have environment officers operating within them with devolved power - By 2029 all provinces operating with devolved power - 6m ha of forest under formal conservation agreements 	<p>Notes on financing:</p> <p>Significant existing finance to conservation channelled both through and outside government. Limited finance for environmental monitoring and enforcement practices.</p> <p><i>Government</i> – High gap between spending and identified needs. Options to generate finance through environmental management fees, and biodiversity offsetting scheme (although latter may not channel through government).</p> <p><i>Private sector</i> – potential finance through biodiversity offsetting scheme and options for conservation within production landscapes e.g. 10% conservation areas in FMAs.</p> <p><i>Climate finance</i> – Potential project scale interventions, also options for programmatic support to conservation.</p> <p><i>Development partner</i> – Ongoing support with options to continue.</p> <p><i>Philanthropy</i> – Options to expand finance</p>		

¹ Costing from Operation Painim Garun Planim Diwai

Strengthen environmental safeguards	<p>Key sub-actions will include:</p> <ul style="list-style-type: none"> - Increasing awareness of all stakeholders of environmental regulations - \$1,622,880 - Increase capacity of CEPA, in partnership with other agencies, to manage permitting process (including development of environmental management information system) - \$727,520 - Build capacity of provincial governments and designate authority for environmental management - \$11,997,717 	\$14,348,117	<p>Improved environmental management has potential to reduce negative environmental impacts and maintain key environmental services e.g. reduction in flooding, reducing run off into streams and rivers</p> <p>Indicative emission reduction potential – 1.6mtCO₂e</p>	Limited existing support through SPREP and GEF. – Additional financing needed
Enhance protected area development and management ²	<p>Costing based on Protected Areas Policy Implementation Plan (PAPIP) which including 5 main areas:</p> <ul style="list-style-type: none"> - Governance and Management of Protected Areas - \$3,601,667 - Sustainable Livelihoods for Communities - \$4,733,333 - Effective and Adaptive Biodiversity Management - \$3,843,333 - Managing the Protected Areas Network - \$2,749,333 - Sustainable and Equitable Financing for Protected Areas - \$3,505,000 	\$18,432,667 ³	<p>Strengthened protected areas network will help PNG meet its international commitments as well as preserving key biodiversity areas.</p> <p>Indicative emission reduction potential – 238mtCO₂e</p>	Existing support through number of initiatives including GEF, JICA with future support planned through GEF, and USAID.
Development of a sustainable commercial agriculture sector:	<p>Targets:</p> <ul style="list-style-type: none"> - Demonstrate how sustainable agriculture can be profitable within the PNG context - Develop models of sustainability and production standards that are relevant to PNG 	<p>Notes on financing:</p> <p>Limited central government finance. Ongoing and planned development partner programmes in key commodity sectors.</p> <p><i>Government</i> – High gap between spending and identified needs. Options to support investment environment for sustainable production of key commodities / control of unsustainable approaches. Increased support needed to family farmers.</p> <p><i>Private sector</i> – Significant existing investments. Options to scale up with conducive investment environment.</p> <p><i>Climate finance</i> – Potential for highly concessional loan based finance in key productive</p>		

³ Costing from Protected Areas Policy Implementation Plan

		sectors as well as future RBP as a means to continue to incentivise sustainable approaches. <i>Development partner</i> – Ongoing support with options to continue. <i>Philanthropy</i> – Potential options to expand in targeted pilot areas.		
Strengthen review of agricultural development proposals	Process to improve the review and monitoring of proposed agricultural leases – activity would include establishment of a review panel as well as improved standards and would be implemented in close collaboration with specific sector work.	\$770,250	Indirect benefits linked to reduction in rates of deforestation.	No current finance.
Increase sustainable Palm Oil production	<p>Actions include:</p> <ul style="list-style-type: none"> - Establishment of a collaborative framework for sustainable palm oil development - \$2,175,685 - Implementation of enhanced standards for palm oil and agricultural development in PNG - \$1,088,325 - Support to increases in small holder productivity - \$46,023,056 	\$49,287,067	<p>Potential increases in smallholder income of \$4,500 per annum</p> <p>Avoided emissions due to reduced land clearing to meet production targets – 10mtCo2e</p>	<p>Existing FCPF support to establishment of palm oil platform.</p> <p>Proposed GCF support linked with private sector co-finance.</p>
Increase sustainable cocoa production	Specific actions and costings not yet developed			
Conservation commodities	Specific actions and costings not yet developed			
Strengthening REDD+ coordination, monitoring, reporting and management	<p>Targets:</p> <ul style="list-style-type: none"> - Systems for the monitoring and reporting of emissions at the national level fully established and operational - Sector and subnational governments have in place mitigation and adaptation plans - Transparent system of financial management system in place and fully operational including means to link transactions with emissions reductions 	<p>Notes on financing:</p> <p>Existing gaps between finance and identified need. Ongoing development partner / climate finance support.</p> <p><i>Government</i> – Targeted to be self-financing. Options to raise revenue through non-REDD+ specific finance as well as taxes on any emissions transactions or secure percentage of RBPs. Need to strengthen coordination with DNPM for mainstreaming of CC into sector / subnational budgets.</p> <p><i>Private sector</i> – Limited options for direct support.</p> <p><i>Climate finance</i> – Options for ongoing capacity building support. Potential to take percentage of future results based finance for management of monitoring / reporting system.</p> <p><i>Development partner</i> – Ongoing support with options to continue.</p>		

		<i>Philanthropy – Limited potential</i>		
Strengthening climate change legislation, financing and management	Sub-actions: <ul style="list-style-type: none"> - Establish and strengthen coordination mechanisms (including grievance and redress mechanism) - \$1,777,760 - Integration of climate relevant indicators into the development planning framework - \$1,447,540 - Strengthen management and reporting of emissions from land use and forestry - \$947,865 - Establish and Strengthen a Safeguard Information System - \$424,380 - Development of a registry of activities linked to forest carbon - \$583,590 - Establish system for management of RBPs - \$1,135,440 	\$6,316,675	Impacts focused on capacity to access Results based finance and as well as guide policy and decision making on action to deliver REDD+ results.	Existing support the FCPF with planned additional support through GEF. Additional finance required for ongoing development.

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Acronyms

ACIAR	-	Australian Centre for International Agricultural Research
ADB	-	Asian Development Bank
BUR	-	Biennial Update Report
CC	-	Climate Change
CCA	-	Community Conservation Area
CCDA	-	Climate Change Development Authority
CCMA	-	Climate Change Management Act
CDM	-	Clean Development Mechanism
CEPA	-	Conservation and Environmental Protection Authority
CORSIA	-	Carbon Offsetting and Reduction Scheme for International Aviation
DAL	-	Department of Agriculture and Livestock
DFAT	-	Department of Foreign Affairs and Trade (Australian Government)
DLPP	-	Department of Lands and Physical Planning
DNPM	-	Department of National Planning and Monitoring
DSS	-	Decision Support System
EMIS	-	Environmental Management Information System
ER	-	Emission Reduction
EU	-	European Union
FAO	-	Food and Agriculture Organisation
FCA	-	Forest Clearance Authorities
FCPF	-	Forest Carbon Partnership Facility
FFB	-	Fresh Fruit Bunch
FMA	-	Forest Management Areas
FPDA	-	Fresh Produce Development Authority
FRIMS	-	Forest Resource Management Information System
FRL	-	Forest Reference Level
GCF	-	Green Climate Fund (GCF)
GEF	-	Global Environment Facility
GIS	-	Geographical Information System
Ha	-	Hectare
HCS	-	High Carbon Stock
HCV	-	High Conservation Value
ICAO	-	International Civil Aviation Organization
IFAD	-	International fund for agricultural development
IMO	-	International Maritime Organisation
ITMO	-	Internationally transferred mitigation outcomes
JICA	-	Japanese International Cooperation Agency
LCOP	-	Logging Code of Practice
LLG	-	Local level government
MRA	-	Mineral Resource Authority
NDC	-	Nationally Determined Contributions
NEC	-	National Executive Council
NFI	-	National Forest Inventory
NFMS	-	National Forest Monitoring System
NFS	-	National Forest Service
NRS	-	National REDD+ Strategy
OPIC	-	Oil Palm Industry Cooperation
PA	-	Protected Area
PAPIP	-	Protected Areas Policy Implementation Plan
PHARMA	-	Pacific Horticultural and Agricultural Market Access

PNG	-	Papua New Guinea
PNGFA	-	Papua New Guinea Forest Authority
PPAP	-	Productive Partnerships in Agriculture Project
PS	-	Private sector
RAFT	-	Responsible Asia Forest and Trade
RDP	-	Results Based Payments
REDD+	-	Reduced Emissions from Deforestation and Forest Degradation, the sustainable management of forests and the conservation and enhancement of forest carbon stocks in developing countries
RSPO	-	Roundtable on Sustainable Palm Oil
SABL	-	Special Agricultural Business Leases
SDM	-	Sustainable Development Mechanism
SIS	-	Safeguard Information System
SMUP	-	Sustainable Land Use Policy
TA	-	Timber Authority (a form of timber concession)
TLS	-	Timber Legality Standard
TLVS	-	Timber Legality Verification System
TMR	-	Torricelli Mountain Range
TNC	-	The Nature Conservancy
TRP	-	Timber Resource Permit (a form of timber concession)
TWC	-	Technical working committees
UNDP	-	United Nations Development Programme
UNFCCC	-	United Nations Framework Convention on Climate Change (UNFCCC)
USC	-	University of the Sunshine Coast
VCM	-	Voluntary Carbon Market
WB	-	World Bank – WB
WCS	-	Wildlife Conservation Society

Section 1. PNG Context, REDD+ Development and Existing Abatement Options:

Summary

This overview assessment notes a number of key elements of a mechanism on REDD+ and the current situation for PNG including:

- PNG has relatively high levels of emissions associated with the forest sector which are anticipated to increase from just under 40mtCO₂e per annum in 2013 to over 50mtCO₂e per annum in 2020
- Deforestation has historically followed forest degradation by commercial logging with deforestation driven primarily by family agriculture
- The impact of commercial agricultural appears to be on an increasing trajectory
- The country has made significant progress in planning how to address emissions and to monitor and report on changes in emissions.
- There is the potential to deliver over 17mCO₂e of emission reductions against 2013 levels through implementation of a combination of policy actions and targeted activities (see table XX).
- To achieve high levels of emissions reductions there is also the need for actions across sectors to be coordinated as actions to reduce emissions in one area can be easily be eliminated by increases in forest clearing or degradation in another.
- Delivering such emission reductions without targeted action to support economic activities would result in a significant economic cost with a reduction in logging activity alone resulting in a loss of government revenue of \$32m per annum.
- Focus on preventing the direct drivers of emission alone not deliver long term emission reductions as demand for land for economic development remains significant due to population increase and a need to support social and economic development in PNG.
- Indirect REDD+ actions focused on reducing the impacts of as opposed to preventing key economic development activities have significant potential for emissions reductions while maintaining economic growth. For these to be effective however there is a need to ensure an effective enabling environment to support them.

Table 4: Summary of Potential Emission Reductions

Potential areas for emissions reductions	Emission reductions (tCO ₂ e)
Reduced logging activities (ending of timber concessions)	9,346,425
Reduced impact of remaining logging activities -	2,732,476
Development of plantation areas	2,364,059
Reduced levels of conversion (through conservation, land use planning, improved application of environmental permits)	2,742,594
Total	17,185,555
Total 2013 emissions	42,401,717
% reduction in emissions against 2013	0.41

Overview of REDD+ Development Process

PNG has been at the forefront of REDD+ development since 2005 when PNG and Costa Rica introduced the concept of reduced emissions from deforestation to the UNFCCC. Since this time PNG has combined active engagement with international negotiations with ongoing development of technical capacity and the political and policy structures for delivering and reporting on REDD+ results as part of the country's overall approach to climate change.

This process has included the establishment of the Office of Climate Change and Environment Sustainability (OCCES) in 2008, which was re-established as the Office of Climate Change and Development (OCCD) in 2010 and, following the passing of the Climate Change Management Act (CCMA) in 2015, has now become the Climate Change Development Authority (CCDA). Since its establishment the Authority has worked closely with partner agencies in particular the Papua New Guinea Forest Authority (PNGFA), Department of Lands and Physical Planning (DLPP), Department of Agriculture and Livestock (DAL), Department of National Planning and Monitoring (DNPM) and the Conservation and Environmental Protection Authority (CEPA) in moving PNG from a period of REDD+ readiness towards early implementation.

Much of this work culminated in 2017 when PNG launched its National Forest Monitoring System (NFMS) web-portal, was able to submit its first Forest Reference Level (FRL) to the UNFCCC for technical assessment and PNG's National REDD+ Strategy (NRS) was approved by NEC Decision (Decision 126/2017) following a 18 month development process. The achievement of three of the key elements of the Warsaw Framework for REDD+ marked PNG's progress towards early REDD+ implementation and the scaling up of action to reduce emissions.

Critically the NRS and FRL provide both a strategic framework for action as well as an indication of the levels of emissions from PNG's forest that are critical for future decisions to be made on how actions and investments can be prioritized.

The NRS provides a number of guiding statements for how the delivery of REDD+ results should be achieved as well as identifying, a framework for activities across sectors and actions to support coordination of activities and to monitor and report on results. These are summarized below:

The NRS states PNG's approach to achieving REDD+ results should:

- support a transformational change in the way that the country approaches economic and land use development to enable PNG to achieve a low emission, green development pathway
- support sector agencies, communities and landholders to take actions in line with the policies and measures described within the strategy through support based on non-carbon indicators of improved forest management
- be in line with the guidance of the UNFCCC
- initially focus on reporting emissions and removals related to three of the five REDD+ Activities, namely; (1) reducing emissions from deforestation, (2) reducing emissions from forest degradation and (3) the enhancement of forest carbon stocks.
- require any projects targeting the voluntary carbon market to follow guidelines linked to the national REDD+ development process and UNFCCC guidance.

Actions are then divided into two components:

Component 1: Actions to deliver REDD+ Results:

- **Strengthened land-use and development planning:**
 - Strengthened and Coordinated National Level Development and Land Use Planning
 - Integrated Subnational Planning
- **Strengthened environmental management, protection and enforcement:**
 - Strengthening climate change legislation, financing and management
 - Strengthening forest management and enforcement practices
 - Strengthening environmental management, enforcement and protection:

- Strengthen access to information and recourse mechanisms:
- **Enhanced economic productivity and sustainable livelihoods:**
 - Development of a sustainable commercial agriculture sector:
 - Strengthened food security and increased productivity of family agriculture:

Component 2: Actions to support coordination and reporting:

- Focuses on the need to coordinate action to implement the NRS (of which the current document forms part of the response).
- Development and strengthening of FRL NFMS and SIS and BURs.
-

Overview of key sources of emissions

REDD+ as a mechanism under the UNFCCC is primarily targeted at reducing emissions and enhancing removals of GHGs. As such it is through demonstrating changes in levels of emissions and removals that countries' can access results based payments (RBPs).

In developing an investment plan PNG must thus consider:

- where current emissions are coming from and
- what potential there is for reducing these emissions and increasing levels of removals

to maximise the impact on emissions and thus potential returns in terms of climate finance while also considering how such activities fit within the broader social, economic and environmental development pathway of PNG. Indeed in many cases it is likely to be a case of guiding existing or planned development activities towards a low emissions pathway that is able to deliver the highest levels of benefit for PNG and attract the most support through climate finance and private sector investment in indirect actions that still deliver REDD+ results e.g. plantation development.

PNG's FRL identifies total emissions from the forest sector between 2001 and 2013 as totalling over 410mtCO_{2e}, at an average of over 31 mtCO_{2e}. These emissions are identified as resulting from over 2.2m ha of forest being cleared or degraded, with forest degradation being by far the most extensive at just over 2m ha, caused primarily from commercial logging. The FRL also identifies a trend in increasing emissions over the reference period and predicts annual emissions will increase from just over 40 mtCO_{2e} in 2013 to 50 mtCO_{2e} in 2018.

With such high emissions levels PNG has an opportunity to receive significant RBPs if effective action can be taken to deliver REDD+ results. Delivering even a 10% reduction in anticipated emissions for 2018 levels would allow PNG to apply for results based finance of \$25m (Kina 80million).

It is important to consider, however, how such a 10% change could be achieved and what the impacts of such a change would be. For example if they were to be achieved by the closing of a number of timber concessions a 10% decrease in timber revenue would equate to the loss of over \$20m in taxes, levies and royalties from the timber sectors as well as the loss of jobs in rural areas.

Thus to gain a better understanding of how emission reductions and removals can be achieved while minimising impacts to the economy a more detailed look at the FRL data is important as well as consideration of the potential emissions impacts of different intervention areas.

Box 1: The importance and impact of additionality and net reporting

Additionality – there are a number of ways of defining additionality but in terms of REDD+ under the UNFCCC the prime approach is based on changes in emissions against a country's business as usual level of emissions which is identified through its FRL. This presents the trend in levels of emissions from the country and predicts what future emissions will be any reduction below this level can be considered 'additional' compared to what would have happened without PNG taking action on REDD+.

Net reporting – under the UNFCCC PNG reports emissions at the national scale across sectors including the forest sector. As such emissions related to REDD+ are reported on a 'net' basis across the country. This means that even if action in one area results in success at preventing deforestation or forest degradation, if an equivalent area in another part of the country is cut down then there will be no net reduction in emissions. Again net change is reported against the baseline of the FRL and as such any change must represent an improvement on what had already been happening or was likely to happen.

These two elements mean that action should be taken to:

- Reduce current levels of activity that cause impacts on forests
- Help manage the expansion of new activities so that they do not occur at a rate above what could currently be expected – e.g. rapid increases in conversion of forest to agricultural land.

With action to achieve these areas also weighed against the environmental, social and economic benefits or impacts of any action.

Where exactly are emissions coming from and what are likely trends

The FRL identifies where emissions are coming from in terms of primary and secondary deforestation and forest degradation.

Forest degradation is seen to be responsible for over 85% of the emissions and comes from the degradation of over 2m ha of forest over the reference period with levels of degradation most significant between 2006 and 2013 where the annual area degraded was consistently between 140,000 and 180,000ha. The FRL also identifies that 90% of this degradation is due to commercial scale logging. Within this, degradation is identified as coming from a number of different concession types – Timber Resource Permits (TRPs) 52%, Forest Clearance Authorities (FCAs) (as a precursor to agricultural expansion) and Timber Authorities (TAs) 16%, Forest Management Areas (FMAs) 25% and Local Forest Areas (LFAs) 7%)⁴.

During the reference period deforestation occurred over 240,000ha, with the majority of this coming from shifting agriculture (61%), 31% coming from expansion of oil palm, and the remainder coming from transitions related to coconut, cacao (both 1%) and other permanent agriculture (2%) as well as other activities (2%).

Within these trends there is also a clear trajectory of forest change with deforestation of secondary forest impacting twice the area of deforestation of primary forest indicating that much of these impacts related to clearing in areas that have already been impacted most likely by logging.

These overall trends, however, potentially disguise a transition in the impact of different drivers with log export data showing that log exports from FCA's have increased from nothing in 2008 and just over 1,000m³ in 2009 to over 1m m³ in 2014 and 2016. These figures can also be seen to closely correspond with a significant increase in levels of primary and secondary deforestation which saw an almost three fold increase in the average area deforested when 2001-2008 (4,540ha per year) and 2009-2013 (12,092ha per year) are compared. While these areas remain small in extent their impact on emissions are considerable given the

⁴ Figures from Collect Earth Assessment presented at PNGFA REDD+ Planning Retreat August 2017.

deforesting of a ha of lowland forest is estimated to release nearly three times the levels of GHG as logging the same area.

Potential impacts of different REDD+ activities:

In response to these direct drivers a number of 'direct' responses can be considered that help to frame decision making on how PNG can most effectively achieve REDD+ results and what impact that could have more broadly. These direct approaches include:

Reduced forest degradation

As commercial logging is seen as responsible for 92% of PNG's forest degradation, action on this is primarily considered with two main approaches noted:

Reduce levels of logging:

A reduction in the levels of logging would reduce levels of degradation; the impacts of such a change would however all be significant on the rural economy. For example, if the current expiry dates for Timber Resource Permits are adhered to, between 2013 and 2029 the area under TRPs would decline from 2.3mha to just 0.48mha⁵, a reduction of just under 79% reduction. If there was a corresponding fall in degradation from TRPs this would result in annual emissions reduction of over 9.3mtCO₂e equating to potential results based support of \$46m⁶. Such a decrease, however, would also be linked to a decrease of revenues from taxes and levies of \$32.8m as well as other benefits bought by investment from the timber industry. As such at current carbon prices there is not a strong economic case for reducing levels of logging, however if higher carbon prices were to materialise then a stronger economic justification exists.

Reduce impacts of logging:

The second approach is to reduce the impact on forest areas of the logging that does occur. Estimates of the impacts of logging in PNG in terms of lost biomass vary significantly within the literature from 25% to some 55% of the standing biomass⁷. It has also been widely reported that in many areas the Logging Code of Practice (LCOP) is not well followed and that the impacts of logging are above what is ecologically desirable and economically feasible. Improving the quality of logging that is undertaken and thus reducing its impacts on forest areas could help to lead to a reduction in levels of emissions, while allowing economic activities to continue.

To exemplify the potential impacts of this - at present PNG's FRL uses a baseline estimate that logging results in losses of 35% of forest biomass⁸. Studies focusing on some of PNG's most effectively run concessions found figures were lower on average between 25-35%. This level of efficiency could be attributed to the full application of the LCOP of practice. If a mid point of this is taken and were applied to all PNG's concessions it could result in annual emissions reduction in the region of 4mtCO₂e, linking with RBPs of \$20m. Such a transition, would require increased support and monitoring of logging companies and would potentially increase their costs, however, at present there is no clear indication that it would result in a significant fall in production and indeed may strengthen global market access for PNG timber, with increased revenue from REDD+ RBPs able to be invested in strengthening the management and monitoring of concessions as well as strengthening investments in other areas of the forest sector / offsetting any royalty losses for land owning communities as a result of lower production levels.

⁵ Estimate on area under TRPs from Forest And Land Use Status presentation at forest sector retreat – August 2017

⁶ Figures based on an extrapolation of data from PNG Collect Earth Assessment, SGS log export monitoring and forest finance assessment conducted as part of the FCPF programme. Vulnerabilities exist within the assumptions as complete information was not available to allow for comparison between production levels from TRPs and permit expiry dates, with a linear relationship between concession area and production may not be accurate. A carbon value of \$5 per tCO₂e is also used.

⁷ Fox Julian C., Vieilledent Ghislain, Yosi Cossey K., Pokana Joe N., Keenan Rodney J.. (2011). Aboveground forest carbon dynamics in Papua New Guinea: Isolating the influence of Selective-Harvesting and el Niño. *Ecosystems*, 14 (8) : 1276-1288.

⁸ GoPNG (2018) Forest Reference Level – this information is based on assessments done by Fox 2010 – who estimates a reduction of 55% and Bryan 2011 who estimates 24%.

Data on the impact of logging is being improved through work under the National Forest Inventory (NFI) and will also combine with information on regrowth of forests to strengthen reporting. For full assessment of the potential impacts in improvements in timber harvesting and legality however further assessments of logged over areas will be required with this information built into the FRL.

Reduce Deforestation:

Levels of deforestation while not the most significant within the FRL have risen significantly during the reference period (2003-13). Estimated emissions, reported in the FRL from deforestation rose from 3mtCO₂e in 2003 and 4mtCO₂e in 2009 to over 11mtCO₂e in 2013 (the last year that data is reported). Addressing these emissions is thus an area of increasing importance. This could be achieved through a number of direct approaches:

Reduction in expansion of Commercial Agriculture:

Clearance of forest areas for larger agricultural activities occurs primarily through use of Forest Clearance Authorities (FCAs). Their prevalence has increased dramatically in the past decade with levels of timber exports from FCA's rising 100 fold from 1,133m³ in 2009 to 1,04million m³ in 2016 or 29% of total log exports.

While the development of commercial agricultural projects is a key element of rural development a review of the number of FCA's that have resulted in sustainable commercial agricultural ventures may be warranted to ensure that such levels of forest loss is delivering development outcomes. This is relevant from both a carbon and forest taxation position. As FCAs are currently exempt from all levies applied to 'conventional' forestry projects, the loss in revenue from timber being exported from FCA's opposed to conventional forestry permits is equal to \$15m based on 2015 export data.

From a carbon stand point if it is assumed that 40m³ of merchantable timber is removed per ha in FCA operations⁹ then based on levels of timber export from FCAs in 2015 over 21,000ha was cleared that year. If this is then linked with reported emissions factors for deforestation¹⁰ an estimated level of emissions from FCAs equates to close to 9.5mtCO₂e per annum. Even a 10% reduction in this level of clearing could thus result in significant benefits.

Improved efficiency of family agriculture:

The expansion of family agriculture is estimated to have resulted in 61% of forest conversion during the reference period a figure that would equate to 6.6mtCO₂e in 2015 with family agriculture covering some 3.2m ha. The expansion is driven largely by rapid levels of population growth within PNG, which is in the region of 3.1% per annum.

If improved agricultural practices were able to achieve a 60% intensity in production as proposed by the government of PNG this could deliver corresponding decreases in the rate of increase resulting in only 40% of the forest area being converted thus reducing emissions by 2.6mtCO₂e

Enhance Forest Carbon Stocks:

PNG has exceptionally high levels of existing forest cover at 78.1%. With high levels of demand for land for agricultural development as well as broader development activities linked to a growing population, this leaves limited areas for mass reforestation and carbon stock enhancement.

Development of a number of plantation areas on existing grasslands or heavily degraded forest areas could however deliver both economic and environmental returns. A 10,000ha *Eucalyptus deglupta* plantation for example could be estimated to generate emissions reductions of 2.5mtCO₂e over a 20 year period. Such plantations would also generate economic gains through engagement of communities in their development,

⁹ It is likely that this is an overestimate as harvest under normal operations is estimated to be close to 15m³ per ha, however lower estimates also provide a level of deforestation in excess of that reported in the FRL and as such cannot be seen as usable without further research and supporting evidence.

¹⁰ An average of the EF for low land degraded and primary forest as reported in the FRL was used.

management and subsequent harvesting. Small-scale woodlots at the community level also have the potential to both enhance carbon stocks and reduce demand for harvesting from natural forests helping to reduce levels of forest degradation, while environmental plantings may also be important in some areas that have been heavily degraded or deforested. Such developments are in line with PNG's *Painim graun planim diwai* programme.

Conserve Forest Carbon Stocks

The conservation of PNG's carbon stocks presents a complex picture in PNG. Conserving forest areas is critical as part of the long-term national approach to REDD+ and designation of areas under formal conservation requirement also provides a safeguards against future deforestation. However as reporting of emissions under the UNFCCC is done at the national level and on a net basis the need to prioritise conservation activities is questionable for two reasons:

One - the benefits from conserving one area can be easily outweighed by losses in another area – e.g. if 10,000ha of forest is placed under conservation it can be argued that this prevents it being deforested or degraded. If a base rate of deforestation and degradation is taken from the FRL for the year 2013 it could then be estimated that just over 49ha of that area would be degraded and 11ha of that are deforested. Such theoretical gains would be easily outweighed by the development of a new commercial agricultural area that clears 1,000ha of forest.

Two – location of conservation activities. PNG has 23m ha of PNG's undisturbed forests that are outside of concessions, only 40% of this area is, however considered 'suitable' for logging based on the parameters of the LCOP and timber quality. Thus while other threats do exist for forests targeting investment in conservation in areas that are not under threat would not present an optimum use of resources from a purely REDD+ / Carbon perspective.

Conversely, however, conservation activities have a potentially valuable role to play in protecting target forest areas that may be under threat as well as maintaining forests within an increasingly populated landscape – e.g. forest areas under threat of development from logging or mining and forest areas around peri-urban settlements. Careful targeting of these investments, however, is important from a REDD+ perspective along with the need for consideration of the sustainability of conservation efforts and how these balance with ensuring ongoing economic and livelihood development. Consideration of how such approaches are decided and quantified is also covered in Section 4 below with regard to decision-making on how finance should be targeted.

Section 2. Summary of Proposed Investment Areas:

The below section provides an overview of proposed actions for implementation under the NRS and indicative costings for their implementation.

The structure of activities has been modified from those outlined in the NRS to further disaggregate where spending is required with regard to specific REDD+ architecture and spending related to the development of 'indirect' REDD+ actions that will deliver REDD+ results.

The total indicative costs from implementation is over \$230m over 10 years

Box 2: Direct and Indirect REDD+ Actions

Direct REDD+ actions relate to those actions needed specifically for REDD+ and include the establishment of the specific REDD+ architecture (NRS, FRL, NFMS, SIS as well as financial management systems, benefit distribution systems etc).

Indirect REDD+ actions relate to those actions that will deliver REDD+ results but those results are not the primary objective e.g. establishment of a protected area for nature conservation, establishment of a plantation for timber supply. In most cases these actions will have the most significant impacts and attract the most financial support with any REDD+ finance acting as a catalyst to support their implementation and REDD+ related outcomes e.g. a subsidy to plantation development companies

	Action Areas	Costs
Component 1	Development of National Sustainable Land Use Policy and Regulations and means of implementation:	11,275,740
	Enhanced assessment and monitoring of environmental permit applications	14,348,117
	Expansion of Protected Areas	18,432,667
	Strengthening Forest management and Enforcement Practices	135,515,219
	Establishment of planted timber supply	6,666,667
	Strengthen sustainable agricultural development	62,515,234
Component 2	Strengthening REDD+ coordination, monitoring, reporting and management	6,316,675
	Total	235,945,735

The cost estimate should however been treated with extreme caution due to:

- Challenges in developing effective cost estimates of action needed
- Significant discrepancies between cost estimates provided by different sources
- Challenges in differentiating between additional and existing spending
- Challenges in estimating costs across different stakeholder groups and between costs to establish enabling environments for activities and the total investment costs needed

Based on this significant additional work is required to develop key sector activities building on these existing baselines and ideas with a number of proposed actions and next steps identified within each action area.

Within each area existing and potential development partner support has also been reviewed along with government spending to provide an indication of financing gaps.

Key findings note that there are large gaps between existing government spending and estimated costs with total funding needs identified over 50% of existing budgets for the sectors.

That conservation action has and is likely to receive high levels of development partner support along with agriculture while more contentious sectors such as forestry and landuse planning attracting less donor interest.

Strengthen Coordinated national and subnational land use and development planning

Decision-making on the use of land forms the basis for any actions to deliver REDD+ results. In PNG communities play a central role in this process with over 97% of land under customary ownership. How this customary ownership intersects with formal state processes for the allocation of land for development face a number of challenges.

Limited information on current land uses (including their cultural, economic and environmental importance), potential future land use needs (e.g. subsistence agriculture for a growing population) or how groups wish to manage land as well as challenges in communicating between decision making processes at national or provincial level and communities on the ground has led to a number of difficulties in the way land has been allocated.

This has resulted in overlaps between land areas allocated for different purposes, critically areas allocated for conservation vs production processes, allocation of land against the will of land owning communities or for inappropriate development activities. Efforts have been made to address these challenges within both the Department of Lands and Physical Planning (DLPP), through development of a database of registered land as well as work on land use zoning for urban areas. Rural areas under customary ownership however remain largely without land use plans despite the Department being mandated to develop Provincial and National land use plans under the Lands Act (1975). Sectors have also made significant efforts to develop spatial information linked to their activities, work within Minerals Resource Association (MRA) has established a mining cadastre portal (<http://portal.mra.gov.pg/Map/>) to provide information on mining concessions, the Conservation and Environmental Protection Authority (CEPA) has plans to develop a spatial map of conservation areas and the PNG Forest Authority has developed the National Forest Monitoring Portal (<http://png-nfms.org/portal/>) which provides spatial information on different concession types. Linkages between systems and procedures for allocating land remain limited and lack simple mechanisms for assessment of whether land use proposals are in line with local interests, resulting the risks of overlapping land use allocations and well as poor land use decision making.

In an effort to address these challenges the DLPP have developed a draft Sustainable Land Use Policy (SLUP) that provides for the development of subnational and national land use plans utilising a simple set of land use zones. The current action area will support the further development of this approach and to:

- develop an effective national land use planning framework – including policy, legislation, regulations and guidance, information materials
- establish an operational national land use information management system that brings together information from across sectors and can increase transparency and effectiveness of land use decision making and
- support the development of subnational land use plans to be included with local, district and provincial development plans (under the Planning and Monitoring Responsibility Act (PNGPMRA), (2016)) that provide guidance on the desired uses of land bringing together PNG's bottom up and top down planning processes.

With all areas also supported by capacity building to ensure developments are sustainable.

The action area will link closely with action on REDD+ coordination, monitoring, reporting and management through actions to integrate CC related targets into subnational development plans (with potential for forest cover to be one of the indicators in this process) as well as action on strengthening environmental safeguards with proposed land use zones being integrated into assessment processes for issuing of environmental permits (e.g. if an area is identified as of environmental or cultural importance it will require a higher level of assessment than one identified for development).

Targets:

- Establish a national sustainable land-use planning framework

- Integrate spatial plans into provincial, district and local level government (LLG) development plans

Drivers and Barriers addressed:

- Drivers: Expansion of development activities in particular agriculture and logging
- Barriers - limited information on land use, limited transparency in development planning and citing of development activities

Impacts:

Improving the quality of land use planning and its integration with development planning will incentivise actors to maintain forest areas as well as providing the tools to do so.

Costs:

Costs of implementation are estimated to be over \$11million over a ten-year period. Such additional spending would equate to an increase of just over 10% of the budget of the Department of Lands and Physical Planning although expenditure could be spread between DLPP and subnational governments as part of their development planning process.

Table 5: Summary costing for development of National Sustainable Land use policy, regulations and means of implementation

Action Area	Implementation cost over 10 years
Development of National Sustainable Land Use Policy and Regulations and means of implementation:	11,275,740
Development of Sustainable Land Use Policy and Regulations	996,740
Development of National Land Use Information System	3,075,600
Development of Ward, LLG, District and Provincial Plans to include spatial elements	7,203,400

Existing Support:

PNG is receiving some initial support to mobilise these actions through the FCPF 2 project, which, is providing initial support to the development of the National Sustainable Land Use Plan as well as initial work on the trialing of subnational land use planning.

A number of subnational projects have also target action on land use planning in particular targeted towards conservation outcomes with a significant number of participatory land use plans developed for areas proposed for conservation. Work in Madang under the Lowering Emissions from Asia’s Forests (LEAF) project also worked towards the development of a low emissions land use development plan for Madang province. This work has been continued through the below project:

- **Madang Low Emissions Development Project (Australia Aid – TNC – 2017-2018)** – the project is working to support the development of participatory low emission development plans at the provincial and local level including engagement of forest and mining companies in discussions on potential low emission development activities.

Budget – Not yet compiled

Future support is also anticipated through Global Environment Facility (GEF) 7 as well as Green Climate Fund (GCF) finance such support, however, will not be sufficient to operationalize land use planning across PNG but may help to reduce the costs of land use planning activities through development of key tools and approaches that can be utilized across the country.

Actions and Sub-actions:

Establishment of National Sustainable Land Use Planning Framework

The framework will consist of two main elements, a NSLUP policy and regulations, and a NSLUP information system (covered in the next activity).

The policy and regulations will provide a national level framework for land use planning including criteria for zoning of different areas and guidance on development of Ward, LLG, District and Provincial land use plans and how these link with development planning frameworks. Costed actions focus on development of policy and regulations through both technical support and consultations at national and subnational levels as well as development and implementation of awareness raising activities on new policy and regulations.

Estimated implementation costs: \$996,740

Early Progress

A draft NSLUP Policy has already been developed and is in the process of being revised with support from the Forest Carbon Partnership Facility (FCPF) Project. A revised version is planned for completion in early 2019.

Development of a National Land Use Information System

The DLPP has worked to develop a database of land registration and some initial spatial mapping of urban developments. Further strengthening a central land use information system will allow for the DLPP to provide a key tool to other sectors and subnational actors to support land use planning. The system can also link with those for PNGFA, CEPA, Mineral Resource Authority (MRA) and agriculture to help provide a clear portal for how land is being allocated and utilised in PNG. This will provide a critical resource to support land use planning and prevent allocation of overlapping concessions, land titles or other forms of zoning as well as increasing the transparency of land use decision making.

Estimated implementation costs: \$3,075,600

Development of spatially explicit subnational development plans

Development of spatially explicit development plans will include engagement with communities, ward, local level, district and provincial governments to include simple spatial plans within development plans including broad zoning of land areas in line with the national land use planning framework. Land use zoning will be based on a bottom up process to all land owning communities to identify areas for specific activities and will be supported by provincial and district assessment of population growth and key economic development opportunities.

Estimated implementation costs: \$7,203,400

Box 3: Importance of linking land use and development planning

It is proposed that land use plans become a required element of any subnational development plan with these plans required for sub-national governments to access their budgets – thus providing a clear incentive for planning to occur even if at a basic level.

Early Progress

Support it being provided to Pomio district to develop a revised development plan that incorporates spatial elements and land use zoning.

Next Steps and Priority Actions

Central to the potential benefits and sustainability of the land use planning system will be:

- Demonstrating its utility to planners and communities through integration into the development planning framework. Both through links with district and provincial development plans and as part of the safeguards mechanism linked to applications for land use change. As such plans should both be seen as providing a use to government agencies to attract support from target line agencies e.g. for agricultural development as well as to communities to ensure that the identified use of their land is not changed without consultation.
- Establishment of a cost effective approach to planning that can be rolled out across the country.

Based on this it is critical that early demonstration activities are developed to both perfect approaches and to demonstrate utility to key decision makers who can then act as champions for change.

Draft

Strengthening Forest Management and Enforcement Practices

PNG's timber industry provides significant income to the country and to rural communities. The industry, however, also causes significant levels of forest degradation with levels of emission related to forest degradation with an average of 90% of emissions from forest degradation attributed to logging. A figure that equated to 28mtCO₂e of emissions in 2013.

The action will strengthen the way production forests are managed by both commercial and small scale operators as well as increasing the availability of future timber supplies through development of planted forest.

Drivers and Barriers Addressed

- Drivers – Forest degradation through large and small-scale timber production
- Barriers – limited information on the nature of PNG's timber resources, limited capacity of PNGFA to effectively monitor concession areas, limited awareness of key stakeholders (local and provincial governments) on legality standards and value of standing forests, limited transparency in allocation of timber permits.

Targets:

- 50% of all concessions classified as fully legally compliant by 2024, 100% fully compliant by 2029
- 50% of small scale operations fully compliant by 2024, 100% fully compliant by 2029
- 22,000ha planted per annum, 220,000ha by 2029
- PNGFA's capacity to provide technical support to PNG's forest management decision making is increased

Impacts:

Climate Impact:

Full implementation would deliver emission reductions of over 34.7mtCO₂e over the 10 year time frame of the RFIP.

This impact level is based on the following assumptions:

- Strengthened application of timber legality standards results in a reduction in impacts on biomass loss in forests from logging of 5% of total biomass (moving from 35% loss of biomass to 30%) based on improved standards as well as improved regrowth of forests after harvesting through assisted natural regeneration.
- No new concession areas are opened
- Area of planted forest expands by 22,000ha per year
- Regulation of small-scale timber operators results in a reduction in impacts on biomass loss in forests from logging of 5% of total biomass (moving from 35% loss of biomass to 30%) based on improved standards as well as improved regrowth of forests after harvesting through assisted natural regeneration.

For a full list of assumptions and information on how reductions are calculated please see Annex 3.

Economic Impact

Quantification of the economic impact of the activity is difficult to provide without more detailed assessment. Ensuring globally recognised legality standards are met however it likely to be important in maintaining global market access for PNG timber and may also open up higher value markets for producers. Strengthening the application of assisted natural regeneration would also provide further income to local communities through payments for seedlings and as well as labour with estimates also indicating that use of the technique can increase levels of subsequent harvest from 15m³ per ha to 75m³ per ha.

Development of planted timber areas would also provide upfront benefits to communities through labour costs as well as future downstream income from timber sales.

Costs

Estimated costs for implementation are over \$134m over 10 years equating to just over \$13m per annum. This level of expenditure is close to \$2.5m over existing levels of recurrent spending by PNGFA, which is close to \$11m although total budget rises to approximately \$26m when income from forestry levies is added¹¹. While many of these additional costs do equate to transformational elements a large proportion are also recurrent linked to increased staffing and operational costs from improved monitoring e.g. within enhancing timber legality ongoing staff costs (\$2 per annum by the end of the 10 years when all staff on board), forest rehabilitation (\$2m per annum) and engagement of a third party verifier (close to \$3m per annum) alone equate to costs of \$7 in additional recurrent expenditure – close to the existing centrally allocated annual budget of PNGFA.

Table 6: Summary costing for strengthening Forest Management and Enforcement Practices

Action Area	Indicative Targets	Estimated Costing over 10 years (USD)	Estimated Emissions reductions over 10 years (tCO ₂ e)
Strengthen application of PNG's Timber Legality Standard	50% fully compliant by 2024 100% fully compliant by 2029	99,842,060	20,400,000
Increase awareness of communities, private sector and provincial governments in the importance of sustainable management of forests and production of legal timber		1,622,880	
Development of national level capacity to manage, improve and utilise forest information systems for monitoring of timber legality		833,414	
Building capacity of National Forest Service (NFS) to monitor concession and work with PS and provincial government in application of timber legality standard		35,846,483	
Rehabilitation of logged over areas		26,164,617	
Engagement third party verifier		35,374,667	
Regulation of small scale timber	50% fully compliant by 2024 100% fully compliant by 2029	28,382,172	349,712
Development and enactment of regulations for small-scale operators		1,824,460	
Strengthen capacity to monitor and enforce new regulations		21,721,072	
Capacity Building of Small-scale operators		4,836,640	
Strengthened Timber Supply from Planted Forests	22,000ha planted per annum 220,000ha by 2029	6,666,667	14,435,012
Awareness raising		327,820	
Land security		116,600	
Nursery		248,046	
Plantation establishment		718,008	
Plantation maintenance		1,942,960	
Silviculture		-	

¹¹ Note that the estimated additional income from levies is based on estimated 'average' levies for three fees collected – Reforestation Levy, Forest Management Levy and Log export development levy.

Environment Protection		850,167	
Commercialisation		320,000	
Research and Development		286,067	
Fixed assets		1,053,333	
Assets Maintenance		506,667	
Administration		297,000	
Increased capacity of PNGFA for policy development planning, training and research		525,100	
Policy dialogue and development – costings for research component and ongoing roll out of NFI not yet collated.		525,100	
Totals:		134,890,899	34,777,867

Existing support:

PNGFA are receiving support from a number of projects aligned with these objectives:

- **FCPF2 (WB - UNDP/FAO – 2018-2020)** – the project is providing ongoing support to the REDD+ development process and is supporting PNGFA in reviewing forest sector legislation and strengthening processes for developing provincial forest management plans as well as through FAO in supporting improvements in monitoring systems for forest areas.

Budget

- **National Forest Inventory – (EU – FAO)** - the project is focused on strengthening the capacity of the PNG Forest Authority and the University of Technology-Department of Forestry to undertake a continuous and multi-purpose forest inventory and complete first multi-purpose national forest inventory of Papua New Guinea as well as undertaking studies are undertaken on forest and tree characterisation and supporting policy dialogue on forestry and timber legality (linked to FLEGT).

Budget – Total \$8.8m of which \$6.5 from EU.

- **RAFT3 – ()** Information not yet compiled.
- **Enabling community forestry in Papua New Guinea – (ACIAR – University of the Sunshine Coast (USC) – 2017-2021)** - This project aims to improve rural livelihoods in Papua New Guinea through family-focused community reforestation and ecoforestry.

Budget - \$1.73m

- **Improvement and management of teak and sandalwood in Papua New Guinea and Australia (ACIAR – USC – 2015-2019)**

The project aims to develop germplasm sources and smallholder-friendly silviculture systems for teak (Papua New Guinea) and sandalwood (Papua New Guinea and Cape York Peninsula). This will enhance smallholder livelihoods in these regions and help Papua New Guinea to achieve its plantation development target.

Budget - \$0.91m

- **Capacity Development Project for Operationalization of PNG Forest Resource Information Management System for Addressing Climate Change (JICA – JICA – 2014-2019)** - The project aims to strengthen the capacity of PNGFA so that it can fully operationalise the NFRIMS, including capacities to update and manage forest coverage and stocks on GIS, efficient forest monitoring system, improvement of inter-agency coordination and technical capacity for REDD+ reporting, and development of appropriate training programs

Budget – Not specified.

- **Madang Low Emissions Development Project (Australia Aid – TNC – 2017-2018)** – the project is working to support the development of participatory low emission development plans at the provincial and local level including engagement of forest and mining companies in discussions on potential low emission development activities.

Budget – Not yet compiled

Overview of Action Areas:

Strengthen application of PNG's Timber Legality Standard

PNG has made significant progress in the development of a Timber Legality Standard (TLS) that will provide the basis for increasing the quality of timber production in PNG as well as increasing access to international markets for timber from the country. PNGFA have also developed and been trialling, with support of international partners, a number of information management and field monitoring systems that can improve the way information on forest resources are managed and concessions are monitored. These systems including the Decision Support System (DSS), the Forest Resource Management Information System (FRIMS) and the National Forest Monitoring System (NFMS). Strengthening the application of these systems and developing effective linkages between these and TLS to develop a full Timber Legality Verification System (TLVS) and ensure its implementation, will however require significant investment.

Key sub-actions to achieve this will include:

- Increase awareness of communities, private sector and provincial governments in the importance of sustainable management of forests and production of legal timber
- Development of national level capacity to manage, improve and utilise forest information systems for monitoring of timber legality
- Building capacity of National Forest Service (NFS) to monitor concession and work with private sector (PS) and provincial government in application of timber legality standard
- Building capacity of NFS to work with PS and communities to strengthen forest regeneration
- Establishment of third party verification system

Estimated implementation costs: \$99,842,060

Box 4: Need to increase assessment of PS costs and potential government cost savings

The current costing presents a highly government centric assessment of costs and does not fully consider costs to business of implementing the standard.

Equally as new technologies being integrated into monitoring systems such as drones and improved IT systems remain at the testing phase no effective estimate of cost savings from their introduction has been made.

Early progress

PNG's Timber Legality Standard has been agreed and is currently being formalised and moved towards submission to the National Institute of Standards and Industrial Technology (NISIT).

Testing of the application of the LCOP and improved monitoring of concessions has also been trialled in a number of concessions.

Regulation of small-scale timber operations

Action will strengthen and clarify regulation for small-scale timber operators to enable them to legally participate within the timber markets as long as effective production standards are met. The action will also help to strengthen small-scale timber supply chains and increase their capacity to engage within the formal and export markets. Key sub-actions include:

- Strengthen regulation of small scale timber operations
- Capacity building of small scale operators to meet standards

Estimated implementation costs: \$28,382,172

Strengthen timber supply from planted forests

Increasing levels of planted timber supply will help to reduce pressure on natural forest areas while also maintaining a strong timber sector. The action will target increasing levels of planted timber through three main sub-actions as well as supporting natural regeneration within concession areas.

- Development of small-scale woodlots
- Undertaking of environmental planting
- Development of commercial plantations
- Assisted Natural Regeneration of Logged over areas

Estimated implementation costs: \$6,666,667

Box 5: Importance of Investment Environment

The investment environment for timber or plantation companies in PNG faces a number of challenges with recent policy directions from Trade and Industry indicating all firms will need to be owned by PNG nationals, changes in the lands act requiring all Incorporated Land Groups to re-register their lands (a potentially complex and costly process), while policies within the sector target a complete ban on log exports by 2020 and have established taxes, fees and levies that amount to in excess of 40% of export values. Any new investors also face significant challenges in identifying and accessing land with processes for customary land registration often lengthy and expensive.

Box 6: Challenges in differential cost estimates for plantation development

These cost estimates, however, are identified as presenting a conservative figure of investment needed for effective plantation development. Initial analysis of costs based on basic levels of labour and equipment inputs for teak woodlots currently being established within ENB provide indicative figures for establishment and maintenance of a woodlot over a 25 year period of over \$1,424 per ha a costs level at which the costs for plantation establishment and maintenance at the scale proposed within PGPD would require investment of over \$300m a figure over two orders of magnitude higher.

Such costs can be offset by income from the sale of timber with analysis indicating that for an example teak woodlot the area would become cash flow positive after 9 years, however this figure is reliant on all funds being provided without subsequent interest payments and then recouped in their entirety from initial revenue.

The below table provides an alternative costing for activities with a significantly smaller area of plantation development based on an average of 2,500 ha (1,000ha woodlots, 1,500 commercial plantations, 500ha environmental planting) being planted each year over the 10 year period.

Additional elements needed within this estimate include costs of land registration or securitisation.

Activity	Indicative Cost over 10 years*
- Development of Plantation Development Business Strategy	\$453,660
- Awareness raising of land owning communities within target areas	\$808,920
- Training programme for lead farmers	\$4,836,640
- Woodlot development	\$10,958,278
- Commercial Plantation Development	\$16,437,417
- Environmental plantings	\$5,479,139
Total Costs:	38,974,054

* Includes 5% inflation

Increased capacity of PNGFA for policy development planning, training and research

PNG's forest sector has been critical to the country's economy both before and since independence. The sector, however, faces a number of challenges if it is to transition to a low emissions economy with challenges in sustainably financing monitoring operations, delivering policy objectives on downstream processing, attracting long term sustainable investment especially with regard to plantation development. Further work to review the economic and financial realities of timber production and identify areas in which changes can be made to strengthen the investment environment for companies will be critical to developing a long-term sustainable industry as well as strengthening the authorities capacity to provide effective research and baseline information on the status of forests to feed into this process. This approach will require action both within PNGFA and across sectors. Initial assessment of activities include:

- Review of existing production costs and benefits
- Policy dialogue on PS engagement
- Review of options for public, private, community partnerships in forestry including harvesting and plantation development

These activities do not include costings for the research elements of PNGFA's working including ongoing implementation of the NFI.

Estimated implementation costs: \$525,000

Next Steps and Priority Actions

The forest sector will play a central roll in how REDD+ results are achieved in PNG and as such is a key focal sector for action. Limited data in terms of finance and potential project implementation combined with the complex political status of forests mean that significant further work is needed to develop priority low emission investment areas and demonstrate the potential for change towards a low emissions trajectory. Key actions areas and next steps to support this includes:

- *Clarification of strategic direction of forests¹²* – as noted in Section 1 PNG forestry concessions are currently entering a significant period of transition as many of the 'old' concessions (issued pre 1991 Forest Act) are coming towards the end of their allocated tenure. While the some of these areas have in recent years ceased operations others have sought to extend their permits. At the same time PNGFA also has significant areas identified as potential new concessions. Deciding on what levels of timber production PNG is targeting and how this production should be achieved will play an important role in signalling action to investors as well as managing emission.
- *Increased assessment of the potential costs and benefits of implementing the TLS* – the TLS provides a central framework for strengthening the nature of production in PNG and increasing the per unit value of timber production in the country. Progress in this area has been significant with a number of different initiatives working towards elements of the framework (e.g. legality standard, monitoring activities, IT systems). Consolidation of this work to provide a clear indication to the markets of the work PNG is doing as well as to government as to the costs and benefits of this work will be important to help consolidate political support, increasing potential investment and supporting PNG's global market position.
- *Development of target approaches to plantation development that are able to secure long term finance* – As noted PNGFA have developed ambitious plans for plantation development. These represent a significant opportunity for forest rehabilitation as well as increases in levels of forest cover. Challenges however exist in the long term financing and commercialisation of potential areas with existing state funding for the programme limited. Establishing systems for public, private, community partnerships for

¹² It is important to note that this recommendation is not to advocate for reduced levels of production but to note the potential for increased levels of production should old concessions permits be renewed and new concessions also come on line.

plantation development and potentially outgrower programmes would provide a strong mechanism to develop a core plantation industry in PNG that would be able to provide high quality products.

Draft

Strengthen Environmental Management enforcement and protection

PNG is one of the world's most biodiverse countries. With current high levels of natural forest cover and relatively low population densities the country is home to a wide range of endangered species as well as unique habitats. The wealth of biodiversity and relatively undisturbed natural habitats also play a critical role in the country's economy with 85% of PNG's population rural and highly reliant on goods and services provided by the natural environment.

Ensuring that these key resources are conserved and managed is thus critical at a global, national and local scale. The Conservation and Environmental Protection Authority (CEPA) is responsible for implementing two key action areas with relevance to this – the application of environmental safeguards that control development activities (administered under the Environment Act 2000) and the development of conservation activities to conserve PNG's natural environment (a new Protected Areas bill is currently in the final stages of submission to cabinet).

Support to action in these areas will help to address levels of deforestation and degradation by strengthening the way environmental safeguards are applied to development activities helping to reduce environmental damage and expanding areas under conservation agreements helping to reduce levels of land clearing and degradation.

Drivers and Barriers Addressed

- *Drivers* – Deforestation and forest degradation through poorly implemented development activities
- *Barriers* – limited capacity to effectively assess and monitor development activities, limited transparency of environmental assessment and monitoring, limited financing and capacity to implement conservation activities

Targets

Strengthened Application of Environmental Safeguards

- By 2024 50% of PNG's concessions have fully up to date environmental management and all new concessions undergo effective environmental impact assessments
- By 2029 100% of PNG's concessions have fully up to date environmental management and all new concessions undergo effective environmental impact assessments
- By 2024 – all environmental impact assessments and environmental management plans are publically available on an environmental management information system
- By 2024 at least 3 provinces have environment officers operating within them with devolved power

Enhanced Protected Area Development and Management

- Bring an additional 6.6m ha under formal conservation
- Establish a sustainable financing system for PA management

Identified Benefits:

Climate Benefits:

Estimating CC impacts of the strengthened application of environmental safeguards is difficult to quantify due to limited specific data on the impacts of weak application of environmental safeguards on forest areas. Indicative figures can be generated based on a series of assumptions including:

- *10% reduction in impact of commercial agriculture on deforestation through improved application of safeguards and improved management of permit issuing process. (note action in these areas will also link with the work on timber legality with environmental permitting being one element of this work).*

This will result in avoided emission of 1.6mtCO₂e over 10 years – 0.3mtCO₂e per annum by 2028

Climate benefits of conservation activities are impacted by the location and nature of forest areas being conserved e.g. depending on forest type and carbon content as well as the likelihood that that area of forest will be deforested or degraded. An initial estimate of impacts was developed using a national average of risks of an area being deforested or degraded to provide a base 'carbon value per ha' (average area deforested per annum / total forest area * average deforestation emission factor plus average area deforested per annum / total forest area * average emission factor forest degradation). This was then multiplied by the area to be placed under conservation working on the assumption that the target 6.2m ha would be achieved in equal quantities over the 10 years of implementation.

This will result in avoided emission of 23.8mtCO₂e over 10 years – 4.3mtCO₂e per annum in 2028

Economic benefits

Environmental degradation presents a significant risk to both national and local economies in both the formal and informal sectors. Quantification of this extremely difficult within a highly dispersed area such as PNG.

Conservation activities will also help to address environmental degradation elements as well as provide a mechanism to support tourism development in some areas and where linked effectively with 'conservation commodity' development can provide additional revenue from agricultural activities.

Direct Costs of Implementation:

The total costs of implementation are estimated to be \$32.8m over the ten-year period. This equates to an annual expenditure of \$3.2 if a basic average is taken a significant addition to CEPA's existing \$7-8m budget. While a large percentage of costs are recognised as transformation e.g. establishing of EMIS or training of staff a significant level also related to recurrent financing including subnational elements linked to the ongoing monitoring of development activities or support to protected areas. Indeed within both costing areas it is anticipated that high levels of expenditure will be based at the subnational level and will require the designation of authority for action from CEPA to subnational government officers and effective financial arrangements to support these processes.

Estimated costings are displayed in two separate tables with the first relating to strengthening environmental safeguards based on estimates developed for the current document while the second table is based on costings developed for the Protected Areas Policy Implementation Plan (PAPIP).

Table 7: Summary Costing for Strengthening Environmental Management Information System

Activity	Indicative Cost over 10 years*
Strengthening Environmental Safeguards	14,348,117
Increase awareness of communities, private sector and provincial governments of environmental permitting process	1,622,880
Strengthen national capacity to manage permitting process	727,520
Building capacity of provincial governments and designation of authority for environmental monitoring	11,997,717

* Includes 5% inflation

Table 8: Summary Costing for implementing the Protected Areas Policy

Goal	Goal Area	Cost (Kina)	Cost USD
Enhanced Protected Area Development and Management (through implementation of the Protected Areas Implementation Plan)		55,298,000	18,432,667
1	Governance and Management of Protected Areas	10,805,000	3,601,667

2	Sustainable Livelihoods for Communities	14,200,000	4,733,333
3	Effective and Adaptive Biodiversity Management	11,530,000	3,843,333
4	Managing the Protected Areas Network	8,248,000	2,749,333
5	Sustainable and Equitable Financing for Protected Areas	10,515,000	3,505,000

Existing Support

The global significance of PNG's biodiversity has enabled the country to attract significant additional support for the development of its protected areas network. Indicative donor support over the past 5 years has been in the regional of \$8m per annum. The majority of this is targeted at protected area development and with nearly 50% targeted at the Kokoda initiative.

R2R Strengthening the Management Effectiveness of the National System of Protected Areas (GEF – UNDP and Woodland Park Zoo – 2012-2018) - the project supports two conservation areas, one of which is already fully gazetted and registered (YUS CA), and the other (Torricelli CA) which is already in the process of finalizing their application as official CA. The intended outputs are the expansion to the landscape level and effective management of the YUS Conservation Area, community livelihood assistance in the YUS landscape with a focus on Conservation Coffee and Cocoa; the formal gazettal and effective management of the Torricelli Mountain Range (TMR), and community livelihood assistance in the TMR landscape proposed CA:

Budget of US\$2,681,145.

Strengthening the Management Effectiveness of the National System of Protected Areas (GEF – UNDP - 2015-2020) The project supports the management capabilities of the PNG State to oversee Protected Area Management. Supporting the transition from DEC to CEPA, implementing the CEPA Act of May 2014, as well as the operationalization and implementation of the draft PNG Policy on Protected Areas (PNG PAP), this includes strengthening policies relating to PA Management and Biodiversity Conservation, increasing capacity of CEPA for effective management of the National PA System, training programs targeting PA managers institutionalized and (iv) Effective management of Varirata NP and its integration into the broader Sogeri Plains Landscape.

Budget - \$10.9m of GEF finance, \$5.8 of other co-finance and \$38m of government co-finance.

Community-based Forest & Coastal Conservation and Resource Management in Papua New Guinea (GEF – UNDP – 2011-2018) – The project aims to strengthen the enabling environment for a community-based sustainable national system of Protected Areas (PAs) containing globally and nationally significant biodiversity; the identification and establishment of new PAs in the country; undertaking Conservation Area (CA) management planning and signing partnership agreements with communities; and providing capacity development and support for implementation of CA Management Plans;

Budget - \$6.9 GEF finance

Biodiversity Conservation through Implementation of the PNG Policy on Protected Areas (JICA -2015-2020)

The overall goal of the project is to set up effective management of the Protected Areas Network by applying the models of protected areas management. To achieve this goal, the project aims to achieve four outcomes; (1) to strengthen institutional framework including formulation of PPA Action Plan and establishment of the National Conservation Council; (2) to enhance the terrestrial PA management model at Varirata National Park and the surrounding Koiari area; (3) to develop a model of establishing a new marine PA; and (4) to raise awareness of the people about biodiversity conservation.

Kokoda Initiative (Ausaid – 2015-2020) – Partnership agreement to support and maintain the Kokoda track as an area for tourism and cultural heritage.

Budget - \$17.9m

Sustainable Wildlife Management Project (EU – WCS – 2018-2023) The project targeted the strengthening of sustainable wildlife management through improved customary management of forest areas around Mt Wilhelm (building on an ongoing project funded by the Darwin Initiative)

Budget \$2 million

Potential Finance

Sustainable Finance of Papua New Guinea's Protected Area Network (GEF – UNDP – 2019-2026) – the project aims to support PNG's ability to fully fill its action on PAs and implement the Protected Area Policy through securing stable and long-term financial resources for the management of protected areas across the country; ensuring that these financial resources are allocated to contribute to improving effectiveness of the management of the protected areas across the country; and ensuring that they are managed cost-effectively and efficiently with respect to their conservation and other complementary development objectives. In recognition of this, the project will assist with the development of a diversified mix of conventional and innovative funding sources and consolidate revenues to finance the ongoing costs of establishing and managing protected areas, and assist the Government to establish a Biodiversity Fund – that will be built on a secure, accountable and transparent financial mechanism, for receiving, administering and disbursing funds.

Budget - \$11,314,679 GEF finance, \$27m other co-finance, \$20m government co-finance.

PNG Biodiversity Programme (USAID – under tender – 2019-2024?) Towards the end of 2018, it is anticipated that a new USAID programme will commence in PNG, with three strategic approaches to address the threats to biodiversity: i) strengthening capacity for environmental decision making, ii) provision of legal and policy education and training, and iii) integrated land use planning. At present, the shape of the programme remains unknown but it is likely to be a competitive small grants program, with grants awarded to local community groups or other community based organisations.

Budget – Indicative budget between \$10-25m

Action Areas

Strengthen application of environmental safeguards

The action will strengthen the application of environmental safeguards at the national and subnational levels helping to reduce undue levels of environmental degradation as a result of development activities. Key sub-actions will include:

Increase awareness of communities, private sector and provincial governments of environmental permitting process

The activity will develop high quality but simple awareness raising information for different target groups including government officers, timber operators, land owning communities, provincial, district and local level government officials. A series of National/Regional (9), Provincial (15) and concession / field level (25) awareness raising events would then also be held to increase understanding of the permitting process.

Estimated implementation costs - \$1,622,880

Strengthen national capacity to manage permitting process (including development of a EMIS)

The activity will develop an Environmental Management Information System (EMIS) through:

- Undertaking a feasibility assessment of what information needs are required and how these can be integrated within / interfaced between existing systems.
- Development of the system to provide a user friendly and transparent system for managing environmental permitting information as well as other information, such as information on biodiversity

(drawn from EIA as well as other conservation assessments). The system should also interface with spatial information to help provide indications of potential overlaps between high conservation value areas and those for which permits have been applied for.

- Training of firms conducting environmental impact assessment and monitoring activities - It is also proposed that training to firms responsible for developing environmental impact assessments and for conducting monitoring activities is included to ensure that there is the capacity for these elements to be carried out to a high standard. The current costing only focuses on the cost of developing the training with it being anticipated that actual trainings would be funded by the firms through CEPA running courses that have an attendance fee.

Estimated implementation costs - \$727,520

Building capacity of provincial governments and designation of authority for environmental monitoring

The activity will focus on enabling provincial governments to play a more central role in implementing environmental management activities through both designating authority for action to provincial governments and providing initial training and capacity building support for them to undertake monitoring and enforcement activities. Costing have focused on expenses linked to training and provision of equipment and support to provincial governments. It is assumed training would be done in two phases:

- *Initial training* - which would involve 2 trainers spending 5 nights in each province to provide training to 10 officers
- *Follow up training* – which would involve 2 officers traveling to each province 3 times over two years to visit example concessions and provide training and guidance to provincial staff.

Estimated implementation costs - \$11,997,717

Enhance protected area development and management

The action will focus on strengthening the capacity of PNG to manage and develop its PAs. This is inline with commitments made by the GoPNG under the Protected Areas Policy 2014 and CEPA have developed Protected Areas Policy Implementation Plan (PAPIP) intended to support this which includes the following action areas (referred to as Objectives within the PAPIP document):

Governance and Management of Protected Areas

The action area focuses on strengthening the legal and institutional framework for protected area management at the national level through development of legislation, regulations and operating procedures, establishment of a registry of areas and at the subnational level (initial work is proposed to focus on 8 pilot provinces¹³) through training of sub-national actors in particular customary landowning groups, ensuring subnational policies, laws and regulations are in line with national legislation and integrating protected areas into provincial development plans and ensuring that 10% of priority conservation areas integrated and aligned with Resource Sectors conservation planning by 2025.

Estimated implementation costs - \$3,601,667

Sustainable Livelihoods for Communities

The action area focuses on ensuring that sacred sites are effectively protected and that sustainable livelihood options in PA's are supported including through support to capacity building of small enterprises. It will also support the development of benefit sharing agreements with communities as part of PA management.

Estimated implementation costs - \$4,733,333

¹³ The 8 targeted Provinces which projects are implemented include; Central, Northern, East and West Sepik, East and West New Britain, Morobe and Madang and any additional specified sites under GEF 6

Effective and Adaptive Biodiversity Management

The action area focuses on strengthening monitoring and management capacity for all PAs including the development of species and land use management plans for target areas, and guidance documents for PA management, resource requirements clearly identified for PAs, capacity of CEPA, provincial, district and local level governments for PA management strengthened, wildlife rangers recruited and trained, and information systems established linked to central PA registry.

Establish a Management Advisory Group and PA network Board and develop business plans for PA management.

Ten to twenty-five (10 to 25) zones and Protected Areas created in five (5) locations being guided by Management Planning Guidelines by 2020.

Estimated implementation costs - \$3,843,333

Managing the Protected Areas Network

The action area will focus on developing, enhancing and managing a PA network that is relevant to the local communities and landscape, protects the diversity of life and forms a well-connected and resilient system. Including action to reclassify old PA's into new legislation, provide training to community representatives, establish networks of Community Conservation Areas (CCAs) and support regional trainings for CCA representatives. Strengthen assessment of target areas for conservation and management along with system for identification and management of areas.

Estimated implementation costs - \$2,749,333

Box 7: Linking communities interested in REDD+ with potential for conservation

There is potential to strengthen links between action under CCDA and CEPA with a number of land owning communities approaching CCDA with interest in conserving their forest areas as part of an approach to REDD+. Such interested land-owners could provide a initial base fro expansion of PNG's CCA network.

Sustainable and Equitable Financing for Protected Areas

The action area focuses on establishing the financing framework for PA management including integration of PA's within national and subnational budgets, and the establishment of a Biodiversity Trust Fund that will be able to access finance from multiple sources, resulting in increasing access to finance through small grants by 20%. In addition the action area targets further support to alternative livelihoods for land owning communities including awareness raising of opportunities, identification of priority livelihood actions and training to communities on those actions (with an indicative 120 pilot areas targeted).

It also notes the need to support community projects (again 120 pilot areas) and to support communities in strengthening self-reliance.

Estimated implementation costs - \$3,505,000

Table 9: Proposed Target Protected Areas

Year for designation	Sites for Designation as Protected Area	Area (Hectares)	Province
2019	Toricelli Mountains at Aitape-Lumi District, Tenkile	185,000	West Sepik Province
	Owen Stanley Range, Brown River Catchment & Kokoda Track Region,	238,000	Central & Northern Provinces
	Nakanai Range Sites, including Tavolo Extension &	17,400	East & West New Britain Province
	Lake Lamo Auru - Hargy &	1,860	East & West New Britain Province
	Ainbul)	25,590	East & West New Britain Province
	Kuk World Heritage Site,	196	Western Highlands Province

Total		468,046	
2020	Huon Terraces at Finshafen & Tewai-Siassi Districts,	49,877	Morobe Province
	Nakanai Range Sites, (ARM	53,495	East & West New Britain Province
	& Muruk & Manginun)	50	East & West New Britain Province
	Wanang,	10,770	Madang Province
	Tonda WMA Extension,	500,000	Western Province
Total		614,192	
2021	Lakekamu,	165,000	Morobe, Gulf & Central Provinces
	Upper Sepik Wetlands,	2,440,000	East Sepik Province
	Karamui,	14,000	Simbu Province
	Nakanai Range Sites,	454,522	East & West New Britain Province
Total		3,073,522	
2022	Collinwood Bay,	80,000	Northern Province
	Volotige WMA,	6,073	Eastern Highlands Province
	Hindenberg Wall	41,584	Western Province
	Kikori River Basin WHS,	2,000,000	Southern Highlands & Gulf Provinces
Total		2,127,657	
Overall total		6,283,418	

Next Steps and Priority Actions

PNG has a strong framework for managing environmental issues and is working to further develop a system for supporting conservation action. It is critical that the capacity to implement these frameworks is also strengthened. Key areas of early action include:

Engagement of subnational governments in environmental management - in line with process of decentralisation in PNG, as well as in recognition of the high costs engaged in travel across the country the opportunity to increase the role of subnational governments in environmental management is high. Ensuring that this is done within an effective national framework that increases transparency and remains simple for implementation (i.e. not a proliferation of provincial and district legislation) will require strong capacity buildings as well as good national systems. Implementation will also require clear delineation of roles between national and subnational actors as well as identification and how costs and income will be managed between these levels.

Next steps:

Development of the EMIS – the EMIS has the potential to provide a central information hub that would provide for increased transparency in operation of all development and conservation activities and would provide a mechanism to link national information and subnational action.

Development of clear approach to designating authority to provincial and subnational actors for environmental enforcement and conservation – CEPA are currently working to develop a cost recovery model linked to environmental permitting and this must include approaches to how subnational governments can finance action.

Identifying varied approaches to PA establishment and management - PNG has the potential to develop a highly diverse and globally significant protected areas network. This network, however, will need to operate within the context of PNG's development and identify ways in which to support both conservation and the strengthening of livelihoods. While much of this may be able to be financed through development partner

and philanthropic sources with additional climate finance and state funds there is likely to remain a shortfall in ongoing finance. With existing projects and programmes looking to link sustainable production of key products (coffee, cocoa, crocodile eggs) with conservation and the potential for significant private sector finance to be available through biodiversity offset requirements consideration should be given to developing an increasingly decentralised approach to PA development with CEPA providing a central framework and performance requirements for areas but allowing, NGO, companies and other groups to take responsibility for development. Similar approaches could also be utilised to development of conservation areas within FMAs with companies required to either deliver services themselves or work with a third party service provider to formally establish and maintain conservation areas within FMAs.

Next steps:

Continued development of key initiatives and projects including the approach to biodiversity offsetting, implementation of sustainable financing project and biodiversity project with close coordination between them to identify potential for performance based mechanisms for conservation area establishment to be developed.

Draft

Development of a sustainable commercial agriculture sector:

The commercial agricultural sector in PNG forms a key part of the economy despite a relatively small area under cultivation (0.65m ha in 2013). The sector exported close to \$1billion in 2016¹⁴ and provides employment for a large number of people with one of the two largest palm oil producers employs over 10,000 people as well as 8,000 small holders while coffee and cocoa production is estimated to support the livelihoods of over 60,000 families.

Production approaches vary by commodity with oil palm and coconut historically dominated by a few large estates that are predominantly on state land with a gradually expanding level of small-holder production. Coffee and cocoa conversely have had a more significant small-holder production approach with some linked to central nuclear estates for processing and export. Within the oil palm sector the two major companies have obtained international certification for sustainability and quality in order to maintain global market access, with over 90% of palm oil exported previously meeting Roundtable on Sustainable Palm Oil (RSPO) standards. Certification within the coffee and cocoa markets are more varied with a small number of producers certified and selling through specific supply chains.

Desire for more rapid commercial agricultural development, however, has led to a rapid expansion in concessions with over 4m ha of Special Agricultural Business Leases (SABL) issued and a rapid increase in this occurring between 2008 and 2011 following amendments to the Forestry Act 1991 (Sec90a and 90b). These leases have faced significant legal challenge but indicate the potential risk of the rapid expansion of commercial agriculture into forest areas with 800,000ha of forest subject to Forest Clearance Authorities (FCAs) in as of 2013, the majority of this area being linked to clearing of forest for commercial agriculture¹⁵.

Linked to this increase in forest clearing has been an increase in levels of emissions linked to deforestation with PNG's Biennial Update Report (BUR) REDD+ Technical Annex indicating that emissions from deforestation have increased from an average of 3.8mtCO₂e between 2001-2010, to just over 9mtCO₂e between 2011 and 2015.

It is recognized that commercial agriculture is a critical part of the economy and its development is important in providing improved livelihood options to communities. Target activities thus focuses on the sustainable development of the agriculture sector and effective assessment of proposed agricultural developments to ensure that any forest clearance results in sustainable development.

- Strengthen review of agricultural development proposals
- Support to sustainable palm oil development
- Support to development of sustainable cocoa and coffee development
- Development of conservation commodities

The action areas also seek to engage in global trends for deforestation free commodities with over 447 companies making zero deforestation commitments around their commodity sourcing.

Targets:

Critical targets of these activities are to:

- Demonstrate how sustainable agriculture can be profitable within the PNG context
- Develop models of sustainability and production standards that are relevant to PNG

Drivers and Barriers addressed:

- Drivers: Demand for increased agricultural production and income
- Barriers – limited stakeholder coordination, gaps in policy, gaps in investment

¹⁴ Observatory of Economic Complexity – Papua New Guinea country page available at

¹⁵ PNGFA Draft National Forest Plan (2013) unpublished^[1]_[SEP]

Impacts:

Overall impacts target:

- Reduced clearing of forest for agriculture due to increases in productivity from existing areas
- Increased market access and prices due to higher production standards and certification
- Increases in small-holder and company incomes due to higher productivity per ha and per unit of inputs.

Initial assessment of potential impacts through support to small-holder oil palm production on New Britain Island indicate that support to improving productivity of (20,000) small-holder plots could result in:

- Increased income of for small-holders of \$4,500 per household per annum (due to increases in yield from 15t/Fresh Fruit Bunch (FFB) per ha to 26)
- Increased income from mills of \$10m per annum
- Avoided emissions of over 10mtCO₂e due to avoided deforestation of forest areas to meet the levels of production increase.

Figures for economic income are taken at year 15 after replanted trees have matured while emissions reductions is calculated over the full 15 year period.

Indicative figures from other key commodities in particular coffee and cocoa also show opportunities for significant increases in productivity per ha and options to reduce the impacts of expansion on forest areas including through use of more efficient drying methods that would reduce wood fuel requirements. Existing certification schemes also show potential for increased market value with producers engaged in the Rainforest Alliance standard receiving a 16k per bag premium for adhering to the standard.

Costs:

Costs of implementation will vary significantly across commodities with an initial assessment of costs for the palm oil sector indicating the need for investments of over \$49m within the first 5 years (see table below) although a significant percentage of this would be provided by private sector operators as part of their efforts to improve productivity. As such the key elements of government action relate to the provision of the enabling environment for such production to occur including policy framework and feeder roads.

Table 10: Summary costs to strengthen action on sustainable palm oil

Activity and Sub-activity	Total cost with Inflation
Creation of a collaborative framework for sustainable palm oil development in PNG	2,175,685
Operation of National POP with sub-national pilot platforms	1,258,425
Development of HCV / HSC Map	230,625
Development of Sustainable Palm Oil Policy	304,225
Development of revised guidance on tax credits for rural infrastructure	128,125
Development of sector conflict resolution systems	254,285
Implementation of enhanced sustainability standards for palm oil and agricultural development in PNG	1,088,325
Establishment of development consent review body	45,600
Review and updating of regulations on development consent	491,375
Development of HCV / HCS assessment tool	264,975
Development of Environmental Management Information System	286,375
Increasing smallholder oil palm productivity	46,023,056
Strengthen capacity of OPIC to support small-holders	187,560
Updating of land title information for small-holder	4,877,395

Provision of loans to small-holders in RSPO supply chains for replanting	16,450,000
Expansion of privatised extension service trial	994,600
Improvements in Small-holder roads	23,513,501
Total Costs	49,287,067

Existing and Planned Support¹⁶

The Market for Village Farmers – Maket Bilong Vilis Fama (MVF) (IFAD –DAL/FPDA - \$27m – 2019-2025) -

The project will target six provinces of PNG. Activities related to the fresh produce sub-sector will be implemented in four provinces in the Highlands Region (Western Highlands, Jiwaka, Simbu and Eastern Highlands) and one province in the Momase Region, Morobe. Galip nut related activities will be implemented in East New Britain. MVF targets around 25,000 farming households, benefiting approximately 125,000 people.

PPAP: the Productive Partnerships in Agriculture Project (PPAP), (IFAD / World Bank / European Union (EU) and the GoPNG – \$50m - GoPNG – 2010 -19). The project aims at improving the livelihoods of smallholder coffee and cocoa producers, by promoting partnership agreements between farmers and agribusiness for the provision of technologies and services, through a package of incentives directly benefitting farmers. The success of the partnership model has prompted GoPNG, IFAD, the World Bank and the EU to approve additional financing to scale up PPAP nationally.

Lead Firm Programme (NZaid) Institutional support to FPDA. The ongoing Lead Firm Programme aims at supporting the growth of three fresh produce sub-sector leaders that source from smallholders.

PHAMA: the Pacific Horticultural and Agricultural Market Access (PHAMA) Program (DFAT and NZAid – AECOM) Project aims to helping Pacific island countries, including PNG, to improve exports of primary products.

TADEP: the Transformative Agriculture and Enterprise Development in Papua New Guinea (TADEP) (DFAT and ACIAR) and brings together five research-for-development initiatives aiming at increasing food security and rural income.

MEP: the Microfinance Expansion Project (MEP) (ADB). It aims at promoting financial inclusion through capacity building provided to financial institutions, financial education and the operation of a risk-management facility. MEP has assisted in creating the Centre for Financial Inclusion (CEFI), which is a public institution responsible for coordinating and guiding financial inclusion initiatives.

FCPF REDD+ Readiness Phase 2 (WB – UNDP - 2017-2020) The project is providing early support to the operation of the PNG Palm Oil Platform and is working to support assessment of HCV/HCS areas and development of an HCV/HCS risk map for PNG.

Planned Finance

Support to Rural Entrepreneurship and Trade in Papua New Guinea (EU – FAO - \$97m -) The planned programme is in the design phase but is anticipated to target two specific objectives, developing three specific sustainable market orientated rural development activities (cocoa, vanilla, and inshore reef fisheries) in East Sepik and Sandaun provinces, and establish strong and efficient value chain enablers including infrastructure and policy environment.

Actions and Sub-actions:

Strengthen Review of Agricultural Development Proposals

PNG experienced a period of rapid expansion of agricultural leases. Many of these leases have been challenged on the basis for procedural issues, while a review of concessions identified for oil palm indicated

¹⁶ Information adapted from The Market for Village Farmers project document.

that of the 1m ha currently assigned only 180,000ha would be commercially viable due to factors such as slope, soil type or size of operation.

Strengthening the process of review of proposed agricultural leases will be critical to ensuring that those areas allocated for agricultural development are genuine and can deliver effective economic returns. The activity will focus on establishing a clear review process and sets of criteria to improve the quality of applications for agricultural concessions. This will be done through establishment of a review panel as well as development of clear standards for application processes. The activity will work closely with and build on work conducted through the PNG Palm Oil Platform that will develop investment standards for palm oil development.

Estimated implementation costs: \$770,250

Support to Sustainable Palm Oil Development

PNG palm oil currently has a high level of global recognition for sustainable production. New entrants to the market however are changing this image and are likely to be locked out of a number of high value markets as well as running the risk of damaging the reputation and market access of other producers.

The activity will focus on supporting government, private sector and other key stakeholders in strengthening the production of sustainable palm oil in PNG. It will work through a multi-stakeholder platform that will develop a palm oil action plan. Key elements of this action plan are anticipated to be:

- Development of a palm oil policy
- Development of information on HCV / HCS forest areas across PNG and development of a risk map as well as PNG specific standards for forest conversion
- Development of a revised tax credits scheme for rural infrastructure
- Development of a sector conflict resolution mechanism
- Support to increases in small-holder productivity.

Estimated Costs:

Full costs of implementing the action plan is yet to be developed although indicative costs for the above activities over a 5 year period are close to \$50m (see Table 10 above) with much of this finance relating to the replanting of old blocks of small-holder oil palm and development and repairs to feeder roads to improve access to markets that could be funded through private sector action.

Support to Sustainable Cocoa and Coffee Development

Cocoa and coffee production provide similar opportunities for increased productivity and reduced expansion with a number of initiatives already working with producers either in the production of certified cocoa and coffee or in linking these actions with conservation initiatives. Costs for the development of specific activities are yet to be developed.

Planned support to target vanilla production may also be able to fall within this area.

Estimated implementation costs: Not yet developed

Box 8: Existing action on and benefits of sustainable cocoa

Outspan are working with over 4,000 farmers to produce cocoa in line with Rainforest Alliance standards with farmers receiving a 16k per bag premium for meeting the standard.

Agmark are working through the Fairtrade certification and export over 200mt of cocoa per annum.

Conservation commodities

The approach would work as a subset of the above sustainable commodity production approaches but with an increased focus on conservation outcomes being supported by income from commodity production. Approaches to this have already been trialed within YUS conservation area and there is potential for further

expansion although higher transaction costs and more niche levels of demand are likely to limit the scale at which initiatives can be developed.

Estimated implementation costs: Not yet developed

Next Steps and Priority Actions

There is already significant support across the agricultural sector and there is potential for this work to be further developed. Priority actions include:

- Development of the Palm Oil Action Plan through the Palm Oil platform to provide a roadmap for palm oil development
- Identification of potential market linkages for further expansion of sustainable cocoa and coffee development
- Identification of niche buyers interested in conservation based commodities

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Strengthening REDD+ coordination, monitoring, reporting and management

PNG has made significant progress in developing its framework for action on climate change and REDD+ specifically. Early action focused on the development of a Climate Compatible Development Action Plan (2010) and subsequent policy, the Climate Compatible Development Management Policy (2014) which identified key areas for action on climate change including targets of a 50% reduction in GHG emissions by 2030 and to reach a point of carbon neutrality by 2050.

Supporting legislation was established in the form of the Climate Change Management Act (CCMA) (2015) and Paris Agreement (Implementation) Act (2016). With PNG's Nationally Determined Contributions (NDC) also being submitted to the UNFCCC as an indication of PNG's commitment under the Paris Agreement.

With regard to REDD+ significant progress has been made on developing the elements of the Warsaw framework on REDD+ with PNG submitting its Forest Reference Level to the UNFCCC, launching its National Forest Monitoring System Portal (<http://png-nfms.org/portal/>) and approving the National REDD+ Strategy (NEC Decision 126/2017) all in 2017, with work also ongoing on the development of the Safeguard Information System (SIS).

The current document represents one of the next steps in this work and notes the need for increased capacity for decision making, coordination, monitoring, reporting and management in a number of key areas with key actions required including:
to achieve this noted below.

- Establish and strengthen coordination mechanisms
- Integration of climate relevant indicators into the development planning framework
- Strengthen management and reporting of emissions from land use and forestry
- Establish and Strengthen a Safeguard Information System
- Development of a registry of activities linked to forest carbon
- Establish system for management of RBPs

Targets:

- Systems for the monitoring and reporting of emissions at the national level fully established and operational
- Sector and subnational governments have in place mitigation and adaptation plans
- Transparent system of financial management system in place and fully operational including means to link transactions with emissions reductions

Drivers and Barriers addressed:

- Drivers: Agricultural Expansion and Expansion of logging
- Barriers – limited information on emissions levels, lack of effective climate financing architecture, limited incentives to reduce the impacts of development activities on forests

Box 9. Modification to Action Area

The action area has been adapted from:

- Strengthening climate change legislation, financing and management and

- REDD+ Coordination and Reporting

That are outlined in the NRS as there are strong linkages between these areas and as such they have been combined. Integration of CC targets within the development, planning framework has also been added under this action area.

Box 10: Aligning action between CCDA and DNPM on climate finance

Work in this area is well aligned with recent work by DNPM with regard to increasing access to CC finance as well working to integrate CC more effectively into development planning.

Impacts:

Development of sector and subnational government plans will increase understanding of the potential impacts of CC and the opportunities to address these challenges.

Establishment of a transparent financial management and emissions monitoring system will help to attract investment and enhance commitment to action on CC by sectors, subnational government, PS and communities.

Costs:

Overall costs of development are anticipated to be \$6.1m over 10 years equating to approximately \$0.6m per annum although costs are stacked towards the early years of implementation due to the establishment of committees and systems. This equates to approximately a 5% increase in spending on CCDA existing recurrent budget although with spending focused towards the initial years of systems development additional percentage range from 7 to 13% in the initial 3 years.

Box 11: Linking costs and benefits of implementation

The proposed actions represent a base level of REDD+ coordination and reporting and could be seen as core overheads for REDD+ implementation. This should be taken into consideration when considering how any revenue from REDD+ is distributed with government needing to maintain these systems over time. E.g. If the country achieved emissions reductions of 10% against current emissions equating to approx 4mtCO₂ per annum and generated revenue of \$20m – 3% of revenue would be needed for basic overheads (note this does not include many elements to strengthen forest monitoring which are included under Strengthening Forest Management and Enforcement).

Table 11: Summary costing for strengthening coordination, monitoring, reporting and management of REDD+ action

Action Area	Implementation cost over 10 years (USD)
Strengthening climate change legislation, financing and management	6,316,675
Establish and strengthen coordination mechanisms (including grievance and redress mechanism)	1,777,760
Integration of climate relevant indicators into the development planning framework	1,447,540
Strengthen management and reporting of emissions from land use and forestry	947,865
Establish and Strengthen a Safeguard Information System	424,380
Development of a registry of activities linked to forest carbon	583,590
Establish system for management of RBPs	1,135,440

Existing support

PNG is already receiving development partner support in a number of these areas or is in the process of developing projects to support action across these areas. Key existing projects include:

- **FCPF 2** – project providing capacity building and technical support linked to coordination on REDD+ and operating of REDD+ TWCs and work on REDD+ Safeguards as well as support to strengthening of monitoring and reporting on emissions.
Budget: \$
- [Preparation of Papua New Guinea's Initial Biennial Update Report to UNFCCC and the Third National Communication Report to the UNFCCC](#) (GEF / UNDP - 2016-2018) - the project has provided support to PNG in development of its Initial Biennial Update Report and TNC including capacity building to staff and development of monitoring and reporting frameworks.
Budget: \$852,000
- [Strengthening capacity in the agriculture and land-use sectors for enhanced transparency in implementation and monitoring of Nationally Determined Contributions \(NDCs\) under the Paris Agreement in Papua New Guinea](#) (GEF / FAO – 2019-2021) The project will work with CCDA, PNGFA and DAL to ensure that by 2020 PNG is preparing reports from the agriculture, forestry and land use sectors

consistent with the requirements of the ETF, including inventories of emissions sources and sinks and information necessary to track progress against priority actions identified in PNG's NDC.

Budget: \$863,242

- **Enhancing capacity to develop a sustainable GHG inventory system for PNG (JICA 2017-2021)** – this technical cooperation initiative is working with CCDA to support capacity prepare transparent, accurate, consistent, comparable and complete GHG inventories. It is focused on supporting Capacity to periodically and systematically prepare the national GHG inventories including implementation of QA/QC procedures is enhanced. Capacity to promote understanding of national GHG inventories, capacity to technically assess the GHG inventory and to make improvements is enhanced for each sector (energy, industrial processes, agriculture, land use, land-use change and forestry, waste).

Budget: Not known

Actions and Sub-actions:

Establish and strengthen coordination mechanisms

PNG has developed a number of technical working committees (TWC) to support REDD+ development including the National REDD+ Strategy TWC, FRL/NFMS TWC and REDD+ Safeguards TWC. In addition the NRS identifies the potential for a National REDD+ Steering Committee to act as an interim body while the National Climate Change Board is being established. The action will focus on the establishment of the NCCB as well as ongoing operational costs for the TWCs as well as establishment of a grievance and redress mechanisms.

Estimated implementation costs: \$1,777,760

Integration of climate relevant indicators into the development planning framework

Climate and land use relevant targets and indicators will be integrated into the development planning framework through creation of sector based climate mitigation and adaptation plans in line with Sec 70 and 74 of the CCMA (2015) and in close coordination with the Department of National Planning and Monitoring. Subnational plans will also be developed as part of subnational development planning required under the PNG Planning and Monitoring Responsibility Act (PNGPMRA) (2016) with spatial elements of planning (including maintenance of forest loss able to be integrated as part of a target framework linked to provision of budgets). Early action should focus on developing the planning framework for this integration, capacity building of target provinces and sectors and its early roll out in a number provinces and sectors most relevant to REDD+.

Estimated implementation costs: \$1,447,540

Early Progress

CCDA are receiving support from the FCPF project in the development of the SIS.

Strengthen management and reporting of emissions from land use and forestry

PNG has already developed a national FRL, which has been submitted to the UNFCCC and has established a NFMS, which provides information on forest and land use concessions. The country also reports on changes in land use and forestry through National Communications to the UNFCCC.

The FRL identifies a number of areas in which information on forest reporting can be strengthened with the NFI also providing baseline data for this. Inclusion of additional information within the NFMS and linkages between that and other forest data systems will also be possible.

The action will target capacity building for development of improved reporting standards and the ongoing management of the process of reporting. This will also strengthen capacity to engage with any third parties working towards the development of subnational actions. Further expenditure is also required to ensure that there is effective data to input into monitoring systems with much of this work being identified within action area Strengthening Forest Management and Enforcement.

Estimated implementation costs: \$947,965

Early Progress

PNG has received support through the GEF for the [Preparation of Papua New Guinea's Initial Biennial Update Report to UNFCCC and the Third National Communication Report to the UNFCCC](#), and is currently developing its project [Strengthening capacity in the agriculture and land-use sectors for enhanced transparency in implementation and monitoring of Nationally Determined Contributions \(NDCs\) under the Paris Agreement in Papua New Guinea](#), the country is also receiving support from JICA in the development of its National Communications to the UNFCCC.

With regard to specific forestry emissions reporting support has been provided by the UN-REDD Programme as well as FCPF project as well as JICA through multiple projects.

Establish and Strengthen a Safeguard Information System

A national level SIS is required for accessing RBPs under the UNFCCC. PNG has made progress in assessing existing national level safeguards and is in the process of designing a full SIS. The system will require further strengthening and ongoing management and operations. Action will focus on developing a central system as well as providing capacity building to other institutions that will provide information for the system.

Estimated implementation costs: \$424,380

Early Progress

CCDA are receiving support from the FCPF project in the development of the SIS.

Development of a registry of activities linked to forest carbon

A registry for carbon based transactions is required to ensure that PNG is able to clearly track and account for how any emission reduction units produced are utilized. The complexity of this registry will depend on the extent to which PNG wishes to allow sub-national and non-government actors to develop emission reduction (ER) units that they can trade independently as well as to what extent PNG wishes to use an internal market for emissions reductions as part of its approach to CC mitigation.

Estimated implementation costs: \$583,590

Box 12: Linking communities interested in REDD+ with potential for conservation

There is potential to strengthen links between action under CCDA and CEPA with a number of land owning communities approaching CCDA with interest in conserving their forest areas as part of an approach to REDD+. Such interested land-owners could provide a initial base fro expansion of PNG's CCA network.

Establish system for management of RBPs

A transparent system to manage RBPs is required to ensure that funds are effectively managed and that RBPs are able to promote further emissions reductions. The system should be linked with the registry and

reporting under the UNFCCC to ensure clarity on how any RBPs are obtained and distributed. It will also require development of a clear benefit distribution mechanism.

Estimated implementation costs: \$1,135,440

Early Progress

CCDA are receiving support from the FCPF project in the development of the current RFIP as well as further work on the development of an effective financing structure for the management of RBPs.

Next Steps and Priority Actions

PNG has the opportunity to show global leadership on REDD+ and harness results based finance to deliver long-term sustainable benefits. To achieve this there will be a need to effectively coordinate and drive actions related to REDD+ at the policy as well as operational levels. It is recommended that action is taken to establish the National Climate Change Board and to support this process and to mobilise DNPM as a coordinating agency and to work with them to ensure that a number of strategic policy and project programme related approaches are developed. There is also a key need to strengthen links between groups engaged in monitoring and reporting actions and those working on policy approaches to ensure that those working in policy areas understand how impacts can and should be measured and reported and those working on policy approaches understanding how reporting and potential results will be accounted for to ensure that PNG is able to maximise impacts.

Potential cross cutting areas for action

There are a number of potential cross cutting areas for action that could bring together different action areas:

Targeted planning and livelihood support to communities in former TRP areas – Based on assessment of existing TRP end dates 1.8m ha of forest will transition from being within a concession to outside in the coming decade. This potentially means a high loss of revenue not only for government but also for local communities with a potential \$10m per annum decline in royalty payments. Many of these areas have basic infrastructure due to logging roads and warfs and as such make potentially promising areas for further development. Developing a targeted support process for communities within these areas to identify potential livelihood options and conduct land use planning would provide an opportunity to deliver a more sustainable transition either away from logging or towards multiple use landscapes that can combine agricultural productivity, conservation and timber harvesting.

Community based conservation and sustainable commodity production – PNG has the potential to market a high number of environmental and social benefits linked to certified agricultural production. A number of organisations are already undertaking this work but opportunities exist to further strengthen and scale up this action.

Review of FCA operations – The area under FCA's increased rapidly over the past 15 years. While some forest clearance is likely for development activities it is also essential to ensure that clearance activities deliver the maximum long-term benefits to communities. Assessment of existing FCA areas to identify levels of success in follow on development activities and areas in which such activities can be better assessed in advance and supported over time would provide a basis for improved policy and regulatory approaches to the issuing and subsequent monitoring of permits for land clearing.

Review of state land use – An estimated 1.5mha of PNG’s land area is under state land. Much of this is currently under some form of plantation activity. While some areas are highly productive others have ceased to be actively managed or are being managed at low production levels. Review of land areas under state lease would provide an opportunity to develop target areas for investment and increased levels of productivity.

Draft

Section 3. Potential Financing Sources:

The previous sections notes that delivering REDD+ results requires action across different sectors and by different stakeholder groups. It also highlights the potentially high costs of implementation and the need for actions to support the transition to a low emissions rural economy that will be sustainable following initial transitional support.

The current section reviews existing and potential sources of finance that can help to support that transition. While a number of options for additional finance are noted it should not be seen as a comprehensive assessment of all potential financing sources.

Key points:

- Finance is available across a range of methods with high levels of finance likely to come from non-REDD+ specific options especially for early action on implementation
- Support to early implementation on REDD+ is available and PNG is working to access support in this area.
- The situation for results based payments remains unclear with negotiations ongoing through the UNFCCC, conclusions from this process may help to release significant additional finance and PNG should work to identify potential target projects and programmes that could attract investment.
- Private sector finance will be critical to developing ‘indirect’ REDD+ activities that deliver rural development while minimising impacts on forest areas – given PNG’s unique environmental and social characteristics potential to attract this investment is high but requires development of clear investable projects as well as government support to improving the enabling environment for investments.
- There is potential to mobilise additional finance particularly for conservation actions through PNG’s biodiversity offsetting scheme as well as through development partner and philanthropic grants.

A summary of financing types is noted in the table below.

Table 12: Summary sources of finance for implementing approaches to REDD+

Type of Finance	Description	Examples of existing / planned finance and further Opportunities
Climate finance	Climate finance for REDD+ can be divided into support for readiness / early action and results based finance (under the UNFCCC, through multilateral/bilateral agreements or through the voluntary markets.	GCF support for early action on REDD+ (\$10-20m grant – higher if loan) Options linked to RBP variable depending on international negotiations. Likely options for large scale project type approaches. Opportunities to link with adaptation / DRR finance e.g. community based land use planning, strengthened family agriculture
Development partner	PNG received \$589m in support in 2015 of which less than 5% related to environment, forestry or agriculture. Considerable support remains that can deliver REDD+ outcomes through conservation, strengthening of forest sector planning and monitoring and support to sustainable agriculture.	Opportunities exist to mobilise and where possible coordinate non-REDD+ specific finance with REDD+ outcomes.
Philanthropic	Philanthropic finance is considerable at a global scale and PNG has potential to deliver a high quality multiple benefits in terms of environmental conservation, social benefits	Opportunities to increase PNG’s profile as a potential area for philanthropic investments that deliver multiple benefits.

	and potentially economic development.	
Public sector	PNG's budget was \$7billion in 2017 with budgets for DLPP, CEPA, CCDA, PNGFA, DAL and the varied commodity boards and organisations coming to an average of \$55m or just 0.75% of government spending.	<p>Opportunities for use of tax credits and exemptions to provide incentives for target investment areas.</p> <p>Options for development of public private community partnerships in some target areas e.g. plantation development.</p>
Private sector	Private sector investment is already considerable within agricultural and forest areas but is impacted by challenging enabling environment that also deters more sustainable investors.	High level of potential investment in indirect REDD+ related land use development e.g. plantation development, zero deforestation commodities (oil palm, coffee, cocoa)

Draft

Climate Finance

Climate finance has been defined as “finance that aims at reducing emissions, and enhancing sinks of greenhouse gases and aims at reducing vulnerability of, and maintaining and increasing the resilience of, human and ecological systems to negative climate change impacts.”¹⁷

Within the context of this report the focus is on finance from international sources that is targeted for climate change and can be utilised by PNG to take action on climate change. This makes a distinction between development partner finance or ODA which may have climate change impacts among other and climate finance with the later dedicated to climate change and being ‘new and additional’ to existing ODA. It should be noted there remain a number of areas in which financing can be considered to overlap e.g. GEF where climate change is an expressed target but funding is not ‘new and additional’. A comprehensive assessment of what is and is not climate finance is beyond the context of this document and as an initial differentiation has been made.

Climate finance provides a significant potential source of support for PNG and the country has already been able to mobilise relatively high levels of finance primarily through grant mechanisms from traditional development partners although some finance has also been mobilised through the Green Climate Fund as well as through private sector actors utilising results based financing streams under the UNFCCC (through the old Clean Development Mechanism – e.g. New Britain Palm Oil Ltd biogas plants) and through the voluntary carbon markets (e.g. April Saloumei REDD+ project).

REDD+ Specific:

Readiness Finance:

A range of bilateral and multi-lateral initiatives have been established to support REDD+ readiness, intended to help countries to have the capacity to effectively monitor and report on emission from the forest sector and to have the strategies and systems in place to deliver emissions reductions and manage results based finance. PNG has received support from a number of these initiatives, most significantly the UN-REDD Programme (a collaborative programme between UNDP, FAO and UNEP) and the Forest Carbon Partnership Facilities (FCPF) Readiness project, implemented through UNDP and now in its second phase. These initiatives have been central in developing the FRL, NRS, NFMS and work on safeguards with the FCPF project ongoing to 2020.

Further finance remains available for this work from a number of bilateral donors as well as the Green Climate Fund although in all areas groups are now looking to see progress towards early implementation of activities. The majority of this finance is provided in the form of grants.

Opportunities:

Green Climate Fund - PNG is currently working on a proposal to the GCF for investment finance that may include grant and loan elements. Support will target both core support to Readiness activities and support to productive sectors including oil palm and forestry.

Box 13: Additionality and Incremental Cost

The concepts of additionality and incremental cost refer to the idea that climate finance should be utilised as a mechanism to make support the additional costs of operating to address the climate needs – for example if a country had previously built a 3m high sea wall to protect from sea surges and due to climate change it was identified that the wall would now need to be 5m then the incremental cost is the additional costs linked to having to be climate proof. Similarly from a mitigation approach if there was a choice for government between establishing a coal power station and a wind farm to produce the same electricity output the incremental cost would be the cost difference between the two (making the assumption that at present it would be more expensive to install the wind power than coal).

¹⁷ United Nations Framework Convention on Climate Change (UNFCCC) Standing Committee on Finance

Bilateral partnerships – PNG can continue to explore bilateral partnership agreements with key development partners that will be able to provide additional support to the central capacity building and institutional framework for REDD+ development.

Results Based Finance

Under the UNFCCC

REDD+ under the UNFCCC is intended as a ‘results based’ mechanism to provide positive incentives to developing countries to deliver REDD+ results.

A pilot programme for provision of results based payments has been established within the Green Climate Fund. The \$500m fund will provide support to countries following submission of their biennial update reports to the UNFCCC, which demonstrate results. A number of caveats exist however in the way in which this finance can be mobilised including the level of emissions reductions a country has to achieve below the reported levels in the FRL and when finance is accessed it will also have to be managed by an entity accredited with the GCF – which currently does not include government entities within the PNG.

Further options may also emerge on how results based finance can be accessed linked to negotiations under Article 6 of the Paris Agreement which provides for countries and private sector to cooperate in helping to reduce emissions. This includes the opportunity for countries to transfer mitigation outcomes, through any recognised mitigation approach, (Article 6.2.) between countries through internationally transferred mitigation outcomes (ITMOs), as well for a mechanisms to be established under the UNFCCC to facilitate the transfer or trading of emissions (expected to be the Sustainable Development Mechanism (SDM) which will act as a successor to the CDM) (Articles 6.4-6.7). A proposal for a framework of non-market approaches is also presented (Article 6.8).

However, it remains unclear at present how these systems will be mobilised and how REDD+ will fit within them with hope that some clarity will be provided on these through negotiations at the COP24

Other Results based finance

A number of results based initiatives have also been established through multi-lateral, bilateral and voluntary market systems.

Multi-lateral:

The WB’s Forest Carbon Partnership Facility (FCPF) and UN-REDD programme have both worked to develop forms of performance based mechanisms with the WB’s Carbon Fund providing a potential follow on results based system for readiness funding. Applicants for this finance must submit an early idea to the Participants Committee followed by an Emission Reduction Project Idea Note (ER-PIN). If this is accepted a letter of intent is signed and a full ER-Programme Document is developed. This process can take two years.

Bilateral:

Multiple bilateral agreements for REDD+ have been developed which vary significantly in scale between small pilot programmes or projects that support a countries REDD+ activities (e.g. DFAT’s support to testing of REDD+ activities in PNG) to very large scale bilateral performance based agreements such as those established between Norway (Norway in particular has established agreements with Brazil, Indonesia, Guyana, Tanzania, Democratic Republic of Congo and Mexico through its Norway International Climate and Forest Initiative). Bilateral agreements mark a significant element of existing REDD+ finance with over

Box 14: Challenges of blending different carbon accounting frameworks

At present a range of frameworks exist for accounting for potential emission reductions. In almost all of the results based systems noted below, different accounting frameworks are used. This presents a significant challenge if countries are seeking to effectively report emissions to multiple funders and also under the UNFCCC.

USD5billion in bilateral support being pledged by twenty-one countries between 2006-14¹⁸. Such bilateral finance agreements may well continue and become part of a system for emissions transfers under Article 6 as noted above.

The Voluntary Carbon Market (VCM)

Due to the slow rate at which international carbon markets under the UNFCCC and indeed specific countries' legislation have developed, a voluntary market for emission offsets has developed. This market is composed in principle of buyers who are *not* required by any law or regulations to reduce / offset their emissions but do so by choice, and project developers who generate emission reductions in line with voluntary standards that have been established. Emissions reductions generated in this market are primarily achieved through projects, which occur in a discrete location over a set period of time.

Projects that fall within the context of REDD+ have been primarily developed by companies or NGO's working with government that aim to undertake forest protection (avoided deforestation or avoided forest degradation) and reforestation/afforestation activities. Typically these groups provide upfront finance¹⁹ to support the project establishment and development, conduct much of the technical work and then also take a percentage of the proceeds to repay their costs and potentially make profit.

PNG has one such project April Salumei, which, was established in 2009, has been certified under the Verified Carbon Standard (a voluntary standard that ensuring the legitimacy of the carbon credits generated) and has been able to generate emissions reductions that have been sold to a range of international companies. The project developer has raised funds to implement the project with their costs then recovered through the sale of carbon credits. Once all of the developers costs have been deducted the remaining funds or 'profit' from the project is shared between government, communities and the developer. The project, however, has faced challenges in the way income has been accounted for and shared with communities and has also faced international criticism for how credits were marketed and sold.

In 2016 the voluntary market transacted 63.4mtCO₂e at a value of \$191m with prices per tonne with an average price of \$3 per tCO₂e. Prices varied widely however from over \$50 to \$0.5 per tCO₂e with REDD+ projects commanding an average of \$4.2 per tCO₂e²⁰.

The market however remains a buyers market with significantly more supply than demand as while 63.4mtCO₂e was transacted project developers reported having 56.2 mtCO₂e of unsold credits on their portfolios²¹.

The future of the VCM, since the signing of the Paris Agreement, has been unclear as the eligibility of carbon credits certified through VCM standards, to be used within reporting to the UNFCCC or national level carbon markets has yet to be clarified. For example credits generated under the VCM standards cannot be used within Australia's domestic emissions compliance system. At this cross roads there are a number of potential future options for the markets²²:

- Voluntary offsets may transition into a domestic compliance markets with some schemes already allowing regulated emitters to use offsets certified by voluntary standards to comply with emissions regulations. Colombia's carbon fuel tax, for example, allows regulated businesses to purchase offsets developed by voluntary standards instead of paying the tax. Similarly, California allowed eligible voluntary carbon projects to transfer into the state's cap-and-trade program via its "Early Action" initiative in order to ensure there was a tradable supply available at the program's start.

¹⁸ EDF and Forest Trends (2018) *Mapping Forest Finance. A landscape of available sources of finance for REDD+ and climate action in forests*. Available at <https://www.forest-trends.org/publications/mapping-forest-finance/>

¹⁹ This may be generated by selling future options to the emissions reductions that will be generated

²⁰ Forest Trends (2018) *State of the Voluntary Carbon Market 2017*

²¹ Ibid

²² Options noted below are adapted from Forest Trends (2018) *Voluntary Carbon Markets Insights: 2018 Outlook and First Quarter Trends* – available at <https://www.forest-trends.org/wp-content/uploads/2018/08/Q12018VoluntaryCarbon.pdf>

- Voluntary offsets may be able to transition into an international, decentralized compliance market (Paris Agreement, Article 6.2) with credits generated through voluntary standards being considered acceptable as ITMOs (see section above on Paris Agreement).
- Voluntary offsets may transition into an international, centralized compliance market (Paris Agreement, Article 6.4). This would mean that current standards are integrated into a future global trading mechanisms overseen by an international body which would function in a similar way to the Clean Development Mechanism (at present this is likely to be a mechanism referred to as the Sustainable Development Mechanism)
- Voluntary offsets may transition into the international aviation market – International aviation emissions are not covered by countries’ national Paris Agreement commitments. Instead, the International Civil Aviation Organization (ICAO) plans to launch the first-ever sector-wide cap-and-trade program the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). CORSIA could rely heavily on carbon offsetting to meet the industry’s emissions reductions targets. Representatives to ICAO are in the process of negotiating the program specifics, including offset eligibility rules. Decisions about which project types and vintages are accepted will have major implications across the voluntary carbon markets.

Dependent on whether all or any of these situations transpire will significantly affect the scale and size of finance likely to be available through projects developed under VCM methodologies and critically on how a projectised approach to REDD+ could be delivered.

Others

Emissions from the international aviation and maritime sectors currently sit outside the Paris Agreement but have recently made commitments to address their emissions. While a number of individual companies already ‘offset’ their emissions through the voluntary carbon market the International Civil Aviation Organisation (ICAO) and the International Maritime Organisation (IMO) have both made commitments to establish a formal system of targets and mechanisms to offset emissions that cannot be reduced. Both agencies have also noted that the means for offsetting to be done will be in line with the UNFCCC and it is anticipated that they will seek to access offsets through mechanisms developed under Article 6.

Opportunities

It is highly likely that demand for results based REDD+ credits will increase as pressure to take action on climate change increases and mechanisms for emissions transfers are finalised under the Paris Agreement. It is likely however than in many cases ‘purchasing’ entities will wish to have a relatively highly of transparency in where their emissions reductions come from – not just national programmes but discrete geographical locations. As such it is pertinent for PNG to further strengthen work towards a number of ‘bankable’ projects that can be developed within the context of the national approach to REDD+. Ensuring that these projects fit with national priorities and are able to link easily with and indeed strengthen national GHG accounting systems will also help to reduce costs and strengthen the impact of projects domestically.

Development Partner Finance

Achieving REDD+ results requires action across a number of sectors and stakeholder groups. Not all of these groups will have delivering REDD+ results as a target objective, with emissions reductions being an unintentional by-product or an additional benefit that allows/ encourages investment to take place.

For example a development partner may fund action on conservation, based on a desire to protect biodiversity, however by helping to protect a specific species or forest area they will also help to reduce deforestation and forest degradation in that area thus helping to deliver REDD+ results. Equally a timber company looking to expand their operations may wish to establish a plantation area on grassland within its concession, while timber is their primary aim the additional revenue that may be obtainable due to the carbon sequestered in the plantation may make the plantation viable.

Key areas of potential finance that is non-REDD+ specific includes:

Development Partner Finance:

Development partner finance already significant in PNG with the country receiving over \$589 in support in 2015, the majority of which comes from bilateral sources (\$455m) and in the form of grants (\$533m), with Australia also the most significant partner providing over \$373m. Only a relatively small proportion of this support has been targeted at forestry, agriculture or environment (\$27m in 2015) of which agriculture accounted for \$13m and environment \$11m.

Opportunities and next steps

Significant increases in development partner finance are not anticipated, however opportunities do exist to mobilise finance to support REDD+ outcomes including through:

Table 13: Opportunities and next steps for development partner finance

Sector	Description	Existing action / potential finance
Forestry	Further support to timber legality work and the national forest inventory will support delivery of REDD+ outcomes through improved adherence to legality standards	JICA support to forest sector Engagement with EU on potential future financing options
Agriculture	Strengthening links between action to reduce deforestation and increase the sustainability of agriculture should be a target area for investment.	The PPAP project has provided significant support to the coffee and cocoa sectors and identification of mechanisms to further strengthen such support are important. Efforts under GEF6 sustainable financing, and GEF7 projects may also help strengthen links between sustainable production and conservation efforts.
Environment	PNG receives significant support linked to conservation – mobilising this finance to help address forest loss in target areas as well as to catalyse additional spending from PS and other groups will be important to strengthening environmental management.	Efforts under GEF6 sustainable financing, and GEF7 projects may also help strengthen links between sustainable production and conservation efforts.

In addition consideration should be given to requesting additional support linked to infrastructure development activities in particular road construction to help strengthen land use planning in surrounding areas as well as early development of sustainable livelihoods along road routes to help reduce the long term impacts on deforestation.

Philanthropy / private giving

The global philanthropy market is significant with an estimated annual spend of \$150billion²³. While the majority of spending is concentrated in the US and Europe, PNG's unique environment and social and cultural context present opportunities to attract philanthropic giving.

The market for such support is also evolving with many donors increasingly interested in measuring impacts and seeking clear social and environmental impacts as well as potentially financial ones. Such groups are in many cases also keen to have direct links with impacted areas and to be able to see personal stories of change.

Opportunities

PNG has the potential to mobilise some philanthropic support and should look at opportunities to market specific project ideas or areas with options increasing where financial needs are blended bringing together a number of financing sources of which philanthropy may be one. Establishment of clear metrics for impact will also serve as a means to increase transparency and increase confidence from potential donors.

Private sector finance:

The potential for delivery of REDD+ results through 'indirect' REDD+ actions is significant and can be seen as having the most potential to address underlying drivers linked to desire for economic development while also supporting REDD+ results.

Key action areas relate to PS spending in:

- Improve logging practices / application of existing regulations on conservation and set aside areas
- Plantation development
- Sustainable agricultural production

Developing these approaches however face a number of significant challenges linked to the broader investment environment in PNG. The country is ranked 109 (out of 189) in the World Bank's Ease of Doing Business assessment (although this is an improvement from 133rd out of 189 countries in 2015) and there are specific challenges relating to both strengthening sustainable agriculture and expanding forestry operations related to access to land and security for tenure, and access to markets with a broader issues linked to policy uncertainty as well as sector specific issues such as changes to log export tax, proposed bans on log exports, as well as regulations on coffee and cocoa export all present challenges.

The role of government is thus critical in mobilising and managing PS finance as it is the rules and regulations within PNG that will help target these investments within areas that support REDD+ results.

In addition to this private sector finance is also likely to be mobilised through requirements for biodiversity offsetting that are currently being developed under the Environment Act. These requirements will likely generate finance that can be used for forest conservation activities. Companies liable for the requirement may well however seek to implement their own projects independent of government or seek third parties to provide the offsets (e.g. conservation NGOs).

Opportunities

There are significant opportunities to mobilise private sector finance to strengthen delivery of REDD+ outcomes including:

- Improved logging practices
- Establishment of 10% conservation areas within FMAs –
- Develop public, private community partnerships for plantation development
- Development of sustainable palm oil production
- Strengthen sustainable coffee and cocoa production

²³ UBS (2017) Global Philanthropy Report. Perspectives on the global foundation sector

In all of these areas commitment through national and subnational policies will be important to both creating an enabling environment to support investment and to further target ways to support sustainable production.

National Finance

PNG domestic budget was approximately \$7billion in 2017 with budgets for DLPP, CEPA, CCDA, PNGFA, DAL and the varied commodity boards and organisations coming to an average of \$55m or just 0.75% of government spending.

These sectors also generate significant revenue for government estimated at over \$500m. Specific taxes, fees and levies from the logging industry alone (not including worker income tax or company taxes) are estimated to generate \$200m although only \$16m is 'direct' revenue to PNGFA with the majority entering consolidated revenue through the log export tax and a significant value being disbursed to landowning communities through a variety of mechanisms.

This level of income is exceptional with Oil Palm, Cocoa and Coffee delivering much smaller finance returns to government although the values of environmental permits and infringement notices issued by CEPA has not yet been consolidated.

Provincial government bodies also have significant resources with average annual budgets of over \$1billion that are reported to currently have very limited levels of environmental spending.

Opportunities

PNG's domestic budget is under pressure and it is not anticipated that there will be significant increases in spending directly targeting emissions reductions, however there are a number of areas in which government finance or the system of taxes and levies can be utilised to support improved action on CC and REDD+.

Use of existing finance / cost neutral interventions

Management of taxes and levies – There are a significant number of taxes and levies that relate to the forest and land use sector and while options exist to introduce new taxes opportunities also exist to use these to mobilise private sector finance towards REDD+ outcomes. Options include:

- *Tax credits / exemptions* – at present there are a range of tax credit schemes available linked to development activities in rural areas or construction of key infrastructure, with some also restricted for logging or agriculture companies. Review of these instruments could provide opportunities for increasing 'greening' of the tax credit scheme to help reduce the costs of doing sustainable business while increasing the costs of less sustainable approaches.
- *Ring fencing of taxes / levies with increased transparency of use* – Within both forest and broader environment sectors there are significant government revenues from taxes and levies. Increasing the proportion of these revenues directed back to those sectors as well as increasing transparency of the revenue use would both help incentivise companies to pay fees (as they would be able to see tangible impacts from them) and would help strengthen government systems. Existing work on the cost recovery model under the Environment Act as well as further work on strengthening private sector engagement in the forest sector should provide additional insight into this area.

Box 15: Importance of financial transparency in attracting investment

Transparency of public income and expenditure remains a challenge within many sectors of PNG. Disbursed officers with limited data systems and connectivity managing diverse projects can result in difficulties in generating consolidated accounts of incomes and expenditures with agricultural commodity boards particularly challenged. Increasing levels of transparency will however be critical if PNG is going to target mobilising further finance for climate change through taxes and levies or to seek to gain further international support linked to government commitments. Development of the Extractive Industries Transparency Initiative is a significant step for PNG and consideration can be given to expanding similar methodologies to other sectors.

Use of provincial finance – increasing links between provincial governments and national agencies on environmental issues to deliver joint environmental activities including monitoring of development activities, tree planting / plantation development and conservation activities provide an opportunity to increase spending in these areas.

Means to increase finance available within government:

New taxes, fees or levies – opportunities exist to introduce new taxes that could raise revenue for actions related to REDD+. Caution must however be exercised in these areas especially in creating additional taxes that may disincentivise investment in relevant sectors or create higher levels of tax avoidance. The forest sector for example is already faced with very high tax requirements with additional burdens not necessarily delivering added benefits. Equally 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. With regard to funds provided by development partners such a management charge is relevant for a point in time when CCDA or the PNG government more broadly is the implementing agency for the funds but at this current stage such costs would be seen as a duplicate of spending by many funders and thus a disincentive. Conversely if investments relate to companies or groups looking to generate emissions and subsequently sell credits such a fee could be relevant but would be seen as more of a tax on transactions and thus should potentially be considered as a separate approach. Options for smaller taxes on visitors to PNG or specific high emissions sectors could also be considered.

Biodiversity offsetting – as noted above it is not yet clear how any mechanism on biodiversity offsetting would be implemented, however ensuring that there is effective guidance and oversight of the mechanism could generate significant revenue that either flows through government, partially through government or at least can be directed towards achieving governmental objectives e.g. priority conservation areas etc.

Green Bonds – green bonds have been developed in a number of states as a mechanism to increase government capacity to support environmental and climate initiatives. Specific projects must be identified for spending that will deliver environmental and climate benefits with verification of these projects required.

Section 4. Options on how to structure REDD+ finance

REDD+ finance is intended to bridge an investment gap and promote changes in the way that development activities are undertaken to reduce their impacts on forests and thus levels of emissions. The primary objective of a financing structure must thus be to be able to deliver the maximum level of emission reductions while also creating the most economically, environmentally and socially sustainable conditions. In developing this approach there are a number of key considerations:

- Should results based finance be allocated ex-ante or ex-post?
- If ex-post should entities be provided with finance or emission reductions?
- What proportion of any results based finance does the central government need?

Further information on these decision areas is noted below, with the example of plantation forestry carried through to help provide an indication of how decisions can be operationalized.

Should results based finance be allocated ex-ante or ex-post?

If performance for undertaking activities that deliver REDD+ results is to be rewarded ex-post a country can decide how this process should occur – should emission reductions and reporting occur only at the national level with benefits then monetised and shared with actors undertaking activities, or should those actors be able to generate their own emission reduction units that can then be traded by the subnational actor?

Example: Ex-ante vs Ex-post

Ex-ante – Government could invest in changing the investment conditions for a company to grow plantations, this could include legislative changes, support in identification of land-owners and establishment of ILGs or a direct subsidy to support plantation development – all of these would equate to a transfer of benefits to the plantation company

Ex-post - Forest plantation development companies could claim RBPs of some form once they have successfully established plantations and levels of emissions reductions can be confirmed.

Example: Financial support vs ERs (only relevant in Ex-post scenario)

An extensive number of plantations have been established which allows PNG to be eligible for RBPs. *Distribution of financial support* – PNG government reports on emissions reductions and receives all RBPs. Financial support is then provided to plantation companies – this could be done through a range of mechanisms, e.g. tax breaks, or direct payments and could be based on simple metrics e.g. number of ha maintained and under production as opposed to very detailed carbon assessments.

Generation of emission reduction units – the entities that have developed the plantations could register their project with a specific domestic or international scheme, undertake carbon accounting and once verified trade those emission units with the central government discounting those emission reductions from any national level reporting.

What proportion of any results based finance does the central government need?

REDD+ results can be generated through a range of activities but all will require a conducive enabling environment that is created by government (see sections above). This includes, at the minimum,

establishment of national monitoring and reporting systems but may also include other investments such as legislative changes, capacity to monitor and enforce activities or indeed undertake activities that may be difficult to gain private sector or other investment – for example engagement with landowning communities to zone land areas or establish landowner committees – or undertaking / maintain activities that may not lead to significant revenue generation e.g. establishment of and on-going management of protected areas. As such there is a need for central government to retain a proportion of any RBPs. There is also a clear precedent for this with regard to other forms of natural resource utilisation or indeed any economic activity with the state collecting royalty payments, fees and taxes that enable it to provide key services that allow economic activity to continue.

Example: Need to retain finance to manage REDD+ management system

An extensive number of plantations have been established which allows PNG to be eligible for RBPs. Central government could take a percentage of revenue generated as a result of this.

If the entity that has developed the plantations is generating its own ER units and trading them the government may take a percentage of that revenue as a tax or as a part of a revenue sharing agreement. If the government is monetising the emission reductions and then rewarding the entity then deductions could occur based on the nature of support provided.

The level of funds retained by government should be a function of the costs to government related to that activity (similar to the cost recovery model being developed for environmental permits), the potential benefits that activity generates to the country (i.e. how desirable it is for the country) as well as the needs to maintain an enabling environment for both the specified activity and broader emission reductions. For example if government has provided support to plantation development in terms of identifying land areas, supporting establishment of land owner groups and providing technical support and seed-stock to a company along with tax concessions for establishment, then subsequent results based financial benefits may be lower than if the government provides no support.

PNG Context and Options for Financial Architecture:

In reality it is likely that a range of approaches and structures may be utilised with these tailored to incentivise specific activity areas e.g. ex-ante payments are likely to be critical in protected area establishment, while ex-post payments may be more relevant in areas that generate revenue such as plantations development.

PNG has already trialled one approach through the development of April Salumei REDD+ project where a non-government entity has been able to generate emission reduction units and trade them internationally. This has provided a valuable lesson in both how to deliver emission reductions and some of the challenges in managing such approaches.

The NRS takes these lessons into account as well as recognising the critical role of government entities at the national and provincial level and their role in creating not only the enabling environment for monitoring and reporting emissions and removals but also for promoting and managing sustainable economic activities that can support significant emission reductions.

Next steps:

As noted above it is likely that initial support to REDD+ will come through a mixture of mechanisms. It is however important for PNG to have a clear vision of the opportunities available and develop preferred options to incentivise action in different sectors that subnational action and international support can help develop. There is thus a need to further strengthen the analysis of potential priority projects and programmes and to identify how best action in these areas can be incentivised and financed.

Annex 1: Overview of Costing

The table below provides summarised costing information. Further information is provided in supplementary material.

Item	Description / Targets	Total costs
Development of National Sustainable Land Use Policy and Regulations and means of implementation:	Targets: <ul style="list-style-type: none"> • Establish a national sustainable land-use planning framework • Integrate spatial plans into provincial, district and local level government (LLG) development plans 	11,275,740
Development of Sustainable Land Use Policy and Regulations	Support to policy and regulations development, national and subnational consultation and subsequent awareness raising.	996,740
Development of National Land Use Information System	Technical support to design and develop system, training of staff, equipment and ongoing support and equipment maintenance	3,075,600
Development of Ward, LLG, District and Provincial Plans to include spatial elements	Technical support to approach development, training and role out to districts	7,203,400
Strengthening Forest Management and Enforcement Practices	Targets: <ul style="list-style-type: none"> • 50% of all concessions classified as fully legally compliant by 2024, 100% fully compliant by 2029 • 50% of small scale operations fully compliant by 2024, 100% fully compliant by 2029 • 22,000ha planted per annum, 220,000ha by 2029 • PNGFA's capacity to provide technical support to PNG's forest management decision making is increased 	135,340,759
Strengthen application of PNG's Timber Legality Standard	Targets: <ul style="list-style-type: none"> - 50% of all concessions classified as fully legally compliant by 2024, 100% fully compliant by 2029 - 50% of small scale operations fully compliant by 2024, 100% fully compliant by 2029 - 22,000ha planted per annum, 220,000ha by 2029 - PNGFA's capacity to provide technical support to PNG's forest management decision making is increased 	99,941,380
Increase awareness of communities, private sector and provincial governments in the importance of sustainable management of forests and production of legal timber	Development of awareness materials and roll out at national / regional / provincial and concession level	1,722,200
Development of national level capacity to manage, improve and utilise forest information systems for monitoring of timber legality	Assment of existing systems, digitising of existing data, establishment of a remote deforestation monitoring system, IT equipment, trainign of staff, depreciation costs	833,414

Building capacity of National Forest Service (NFS) to monitor concession and work with PS and provincial government in application of timber legality standard	Training on GIS/GPS, drones, support to initial trials of system, equipment, additional staff, housing and depreciation costs	35,846,483
Rehabilitation of logged over areas	Implementation of enhanced natural regeneration practices on 60% of logged over areas	26,164,617
Engagement third party verifier	Engagement of 3rd party verifier (based on cost of SGS)	35,374,667
Development and enactment of regulations for small-scale operators	Development of regulations and awareness raising	28,207,712
Review and development of regulations for small-scale timber operations	Technical support to review of regulations and development of new regulations, awareness raising at national provincial concession level	1,650,000
Strengthen capacity to monitor and enforce new regulations	Establishment of a small-scale timber operations unit, operations of the unit	21,721,072
Capacity Building of Small-scale operators	Development of training materials, capacity building to different groups	4,836,640
Strengthen timber supply from planted forest	Including awareness raising, land security, nursery, plantation establishment, plantation maintenance, environmental protection, commercialisation, research and development, fixed assets, asset maintenance, administration	6,666,667
Awareness raising		327,820
Land security		116,600
Nursery		248,046
Plantation establishment		718,008
Plantation maintenance		1,942,960
Silviculture		-
Environment Protection		850,167
Commercialisation		320,000
Research and Development		286,067
Fixed assets		1,053,333
Assets Maintenance		506,667
Administration		297,000
Increased capacity of PNGFA for policy development planning, training and research	Review of existing financing within sector, policy dialogue with private sector, development of approaches to public, private, community partnerships for plantations, ongoing support to policy development	525,000
Strengthen policy dialogue on production forest	Review of existing financing within sector, policy dialogue with private sector, development of approaches to public, private, community partnerships for plantations, ongoing support to policy development	525,000
Research and capacity building	Not yet costed	-
Strengthen Environmental Management enforcement and protection	0	32,780,784

Enhanced assessment and monitoring of environmental permits	Targets - By 2024 50% of PNG's concessions have fully up to date environmental management and all new concessions undergo effective environmental impact assessments - By 2029 100% of PNG's concessions have fully up to date environmental management and all new concessions undergo effective environmental impact assessments - By 2024 – all environmental impact assessments and environmental management plans are publically available on an environmental management information system - By 2024 at least 3 provinces have environment officers operating within them with devolved power - By 2029 all provinces operating with devolved power	14,348,117
Increase awareness of communities, private sector and provincial governments of environmental permitting process	Development of awareness raising materials and awareness activities at national, provincial and concession level	1,622,880
Strengthen national capacity to manage permitting process	Including system design and development, training of national and provincial staff, population of data into system, equipment and depreciation and training of environmental assessment firms of requirements for EIA/EIS	727,520
Building capacity of provincial governments and designation of authority for environmental monitoring	Training to provincial officers and key stakeholders, following trainings, equipment (boats, GPS, computers, vehicles, drones), depreciation of assets	11,997,717
Enhanced Protected Area Development and Management (through implementation of the Protected Areas Implementation Plan)		18,432,667
Goal 1: Governance and Management of Protected Areas	Strengthening inst and legal framework, including integrating MEAs, developing operational procedures, guidelines and regulations (including FPIC). Supporting provincial laws, regulations and integrating PAs into subnational development plans, establishing models for local governance of PAs. Strengthening CEPA financial management, establishing PPP agreements	3,601,667
Goal 2: Sustainable Livelihoods for Communities	Recognition of areas under customary conservation, linking conservation activities and sustainable livelihoods, government recognition of access benefit sharing (ABS) agreements	4,733,333
Goal 3: Effective and Adaptive Biodiversity Management	Development of biodiversity management, planning and reporting, mutli-use management of PAs, strengthening adaptive management and M&E for effective biodiversity management in PAs, promoting merit based staff recruitment, promoting a Protected Area Workforce Community, developing a robust information base for decision making, establishing an asset management system	3,843,333
Goal 4: Managing the Protected Areas Network	Establishing a PA network, strengthening research initiatives, updating PA types to new legislation, encouraging community participation and capacity establishing and integrating PA Biodiversity information system	2,749,333

Goal 5: Sustainable and Equitable Financing for Protected Areas	Establish and promote PA funding facility, establish small grant facility, mobilise support for network	3,505,000
Strengthen Sustainable Agriculture	0	50,057,317
Strengthen review of agricultural development proposals	Assessment of existing concessions, review of lease procedure, strengthening of review process, establishment of a grievance and redress mechanism	770,250
Strengthened Sustainability of Oil Palm Production		49,287,067
Creation of a collaborative framework for sustainable palm oil development in PNG	Operations of Palm oil platform, development of HCV/HCS map, Sust Palm oil policy, revised guidance on palm oil development and tax credits schemes, grievance and redress mechanism	2,175,685
Implementation of enhanced sustainability standards for palm oil and agricultural development in PNG	Establishment of development consent review body, review regulations for palm oil plantations, development of HCV / HCS assessment tool, strengthen EMIS	1,088,325
Increasing smallholder oil palm productivity	Strengthen capacity of OPIC, updating of land title for small-holders, provision of loans to small-holders for RSPO certified production, expansion of privatised extension service trial, improvements small holder roads	46,023,056
Strengthening REDD+ coordination, monitoring, reporting and management	Targets <ul style="list-style-type: none"> • Systems for the monitoring and reporting of emissions at the national level fully established and operational • Sector and subnational governments have in place mitigation and adaptation plans • Transparent system of financial management system in place and fully operational including means to link transactions with emissions reductions 	6,316,675
Establish and strengthen coordination mechanisms	Establishment and operation of NCCB and TWCs, capacity building of NCCB and TWC members, establishment of grievance and redress mechanism	1,777,760
Integration of climate relevant indicators into the development planning framework	Support to development of framework and indicators, sector and subnational consultations	1,447,540
Strengthen management and reporting of emissions from land use and forestry	Technical support to reporting needs, trainings improved equipment and licenses	947,965
Establish and Strengthen a Safeguard Information System	Technical support to SIS development, capacity building of sectors for reporting	424,380
Development of a registry of activities linked to forest carbon	Technical support to registry development, training, equipment for information management system	583,590
Establish system for management of RBPs	Technical support to development, national regional and subnational consultations, training on financial management system	1,135,440

Annex 2: Overview of Existing and Planned Projects

Existing and Planned Development and Land-use Planning

Name	Source	Start Date	End date	Budget	Implementing partner	Government agency	Target outcomes	Key Activities
Development Planning / Land use								
Madang Low Emissions Development Project	DFAT	2017	2018	-	TNC	0	0	project is working to support the development of participatory low emission development plans at the provincial and local level including engagement of forest and mining companies in discussions on potential low emission development activities.

Existing and Planned Finance Strengthening Environmental Management

Name	Source	Start Date	End date	Budget	Implementing partner	Government agency	Target outcomes	Key Activities
Environmental Management								
Strengthening Capacities to Measure, Report and Verify Indicators of Global Environment Benefits	GEF	2012	2016	1,150,000	UNDP	CEPA	The objective of this project is to strengthen targeted capacities to establish and use an integrated Environmental Management Information System.	In addition to the installation of the integrated EMIS and training on its use, the project will help institutionalize the EMIS by demonstrating its value and financial sustainability to stakeholders, as well as facilitating the appropriate legislative and institutional reforms.
Conservation								
Biodiversity Conservation through Implementation of the PNG Policy on Protected Areas	JICA	2015	2020	-	0	0	The overall goal of the project is to set up effective management of the Protected Areas Network by applying the models of protected areas management.	To achieve this goal, the project aims to achieve four outcomes; (1) to strengthen institutional framework including formulation of PPA Action Plan and establishment of the National Conservation Council; (2) to enhance the terrestrial PA management model at Varirata National Park and the surrounding Koiari area; (3) to develop a model of establishing a new marine PA; and (4) to raise awareness of the people about biodiversity conservation.

Building biodiversity research capacity to protect Papua New Guinea rainforest from logging	UK	0	0	-	0	0	0	0
Community-based Forest & Coastal Conservation and Resource Management in Papua New Guinea	GEF	2011	2018	29,900,000	UNDP	CEPA	0	1) Enabling national environment for a community-based sustainable national system of Protected Areas (PAs) containing globally and nationally significant biodiversity; 2) Identification and establishment of new PAs in the country; 3) Undertaking Conservation Area (CA) management planning and signing partnership agreements with communities; and 4) Providing capacity development and support for implementation of CA Management Plans;
Complete Altitudinal Rainforest Transect for research and conservation in PNG	UK	0	0	-	0	0	0	0
Kokoda Initiative April 2013 - June 2016	Australia	2015	2020	-	0	CEPA	0	0
Managalas Conservation Area Project	Norway	0	0	-	0	0	0	0
PNG Biodiversity Programme	USAID	2019	2024	-	0	0	0	Not yet specified - under tender

R2R Strengthening the Management Effectiveness of the National System of Protected Areas	GEF	2012	2018	5,446,895	UNDP	CEPA	The present project falls under umbrella of 'Strengthening the Management Effectiveness of the National System of Protected Areas' programme that will be implemented by CEPA (Outputs 1.1-1.4, Component 1) using National Implementation Modality (NIM) and by NGOs Woodland Park Zoo (Outputs 2.1 and 2.2, Component 2) and Tenkile Conservation Alliance (Outputs 2.3 and 2.4, Component 2). 0	The present project covers Component 2. Component 2 directly supports two conservation areas, one of which is already fully gazetted and registered (YUS CA), and the other (Torricelli CA) is already in the process of finalizing their application as official CA (Torricelli). The intended outputs are (2.1) the expansion to the landscape level and effective management of the YUS Conservation Area, (2.2) community livelihood assistance in the YUS landscape with a focus on Conservation Coffee and Cocoa; (2.3) the formal gazettal and effective management of the Torricelli Mountain Range (TMR), and (2.4) community livelihood assistance in the TMR landscape proposed CA: Alternative protein, focusing on domestic animal farming, fish farming and home gardens. The present Project Document covers Outputs 2.1 and 2.2 above with the total budget of US\$ 2,681,145 which will be implemented by Woodland Park Zoo.
RECH : Ressources, milieux et leur biodiversité	France	0	0	-	0	0	0	0
Strengthening the Management Effectiveness of the National System of Protected Areas	GEF	2015	2020	54,738,558	UNDP	CEPA	Under component 1 of the project, the focus is on supporting management capabilities of the PNG State to oversee Protected Area Management. Supporting the transition from DEC to CEPA, implementing the CEPA Act of May 2014, as well as the operationalization and implementation of the draft PNG Policy on Protected Areas (PNG PAP),	component 1 focuses on four outputs: (i) Policies relating to PA Management and Biodiversity Conservation strengthened; (ii) Capacity of CEPA emplaced for effective management of the National PA System, (iii) Training Programs targeting PA managers institutionalized and (iv) Effective management of Varirata NP and its integration into the broader Sogeri Plains Landscape. Component 2 directly supports two conservation areas, one of which is already fully gazetted and registered (YUS CA), and the other (Torricelli CA) is already in the process of finalizing their application as official CA (Torricelli). The intended outputs are (i) the expansion to the landscape level and effective management of the YUS Conservation Area, (ii) community livelihood assistance in the YUS landscape with a focus on Conservation Coffee and Cocoa; (iii) the formal gazettal and effective management of the Torricelli Mountain Range (TMR), and (iv) community livelihood assistance in the TMR landscape proposed

Sustainable Finance of Papua New Guinea's Protected Area Network	GEF	2019	2026	-	UNDP	CEPA	(1) Total co-financing USD 50,132,923	0
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Existing and Planned Finance: Strengthening Forest Management

Name	Source	Start Date	End date	Budget	Implementing partner	Government agency	Target outcomes	Key Activities
Forestry								
Capacity Development Project for Operationalization of PNG Forest Resource Information Management System for Addressing Climate Change	JICA	2014	2019	-	JICA	PNGFA	0	Aims to reinvigorate the capacity of PNGFA so that it can fully operationalise the NFRIMS, including capacities to update and manage forest coverage and stocks on GIS, efficient forest monitoring system, improvement of inter-agency coordination and technical capacity for REDD+ reporting, and development of appropriate training programs.
Developing DNA-based Chain of Custody Systems for Legally-Sourced Teak	DFAT/AC IAR	2017	2018	182,500	Uni Adelaid		0	This Small Research Activity (SRA) aims to develop DNA-based legality verification and chain of custody systems for teak in Laos, Indonesia, Solomon Islands and PNG, where ACIAR has teak projects.
Enabling community forestry in Papua New Guinea	DFAT/AC IAR	2017	2021	1,754,516	USC	PNGFA	0	This project will design and test tree-based livelihood systems for family-focused community based reforestation; identify how family-focused community based reforestation can be scaled-out to a landscape scale; and identify and test institutional arrangements and policy recommendations that improve access to formal timber markets. The project will improve families' skills for reforestation, establish integrated agricultural and forestry systems, and give community members better livelihood options and greater food security. More households will have better incomes because agroforestry that the project establishes will increase production. The project will also help households to produce more firewood, pole, agriculture, and plantation crops (cocoa and coffee). Communities will have better access to formal timber markets. The project will recommend policy changes, revise Timber Agreements and processes suitable for ecoforestry in Papua New Guinea, and revise Reduced Impact Logging guidelines and management planning for ecoforestry.

National Forest Inventory	EU	0	0	8,800,000	FAO	PNGFA	0	0
RAFT	0	0	0	-	0	0	0	0
Improvement and management of teak and sandalwood in Papua New Guinea and Australia	DFAT/ACIAR	2015	2019	910,000	USC	PNGFA	0	The project aims to develop germplasm sources and smallholder-friendly silviculture systems for teak (Papua New Guinea) and sandalwood (Papua New Guinea and Cape York Peninsula). This will enhance smallholder livelihoods in these regions and help Papua New Guinea to achieve its plantation development target

Existing and Planned Finance – Sustainable Agricultural Development

Name	Source	Start Date	End date	Budget	Implementing partner	Government agency	Target outcomes	Key Activities
Developing the cocoa value chain in Bougainville	DFAT/ACIAR	2016	2021	4,376,341	Uni of Sydney			The project will foster and strengthen public and private sector partnerships and develop enterprises that enhance productivity and access to premium markets, while promoting gender equity, community health and well-being.
Enhancing value added products and environmental benefits from agroforestry systems in Papua New Guinea and the Pacific	DFAT/ACIAR	2015	2019	1,764,344	USC			This project explores opportunities to value add new agroforestry products in Papua New Guinea, Vanuatu, Fiji and the Solomon Islands. This research identifies the best opportunities for value-adding, and is developing value-adding techniques for these products. It is also investigating integrated agroforestry systems in Fiji and Vanuatu that are likely to have environmental benefits such as catchment revegetation and economic returns to smallholders.
Enterprise-driven transformation of family cocoa production in East Sepik, Madang, New Ireland and Chimbu Provinces of Papua New Guinea	DFAT/ACIAR	2016	2021	3,502,074	La Trobe University	CCI PNG		This project will help the smallholder farmers who make up more than 90% of production widely apply these new varieties and straightforward method to increase production and reduce impact of cocoa pod borer
Identifying opportunities and constraints for rural women's engagement in small-scale agricultural enterprises in Papua New Guinea	DFAT/ACIAR	2016	2020	913,682	Curtain Uni	0	0	This project aims to study the factors that explain Papua New Guinean women's low level of engagement in small-scale agricultural enterprises; identify the processes and pathways that help them move into agribusiness; and pilot/scale out identified pathways for women to move from Tier 2 to Tier 3.

Improving Livelihoods of Smallholder Coffee Communities in Papua New Guinea	DFAT/ACIAR	2017	2021	1,199,818	Curtain Uni	PNG Coffee Industry Corporation	0	This project aims to increase returns to labour, particularly for women, through adopting new technologies and farming practices that improve coffee quality and total production while complying with the environmental criteria of the main certification organisations. This project builds on a previous ACIAR project, ASEM/2008/036, which intercropped coffee with food crops and recycling nutrients to develop sustainable production systems for both coffee and food through efficient use of land and nutrients. Intercropping benefited women by enhancing food and income security.
Lead Firm Programme	NZAid	0	0	-	0	0	0	Institutional support to FPDA. The ongoing Lead Firm Programme aims at supporting the growth of three fresh produce sub-sector leaders that source from smallholders.
Olam International Limited: Inclusive, Sustainable, and Connected Coffee Value Chain	ADB	0	0	3,000,000	Olam	0	0	capacity building support to 20,000 smallholder coffee farmers that Olam sources from across Timor-Leste, Indonesia, Viet Nam, and PNG. The TA will help smallholder coffee farmers fully benefit from their inclusion in the coffee value chain by meeting international certification standards and improving the productivity and quality of crops. The TA will also ensure that these farmers are better prepared to cope with the negative consequences of climate change.
Optimising soil management and health in Papua New Guinea integrated cocoa farming systems	DFAT/ACIAR	2016	2020	1,419,436	Uni of Sydney	CCI PNG	0	The project will evaluate opportunities for green waste management of cocoa production to supply nutrients to the soil, and for managing soil in diversified cocoa farming systems to make cocoa crops more nutritious. It will develop region-specific soil management strategies for smallholdings.
PHAMA: the Pacific Horticultural and Agricultural Market Access (PHAMA) Program	DFAT / NZAID			-	AECOM	0	0	Project aims to helping Pacific island countries, including PNG, to improve exports of primary products. Working to establish a cocoa and coffee platform

PPAP: the Productive Partnerships in Agriculture Project (PPAP)	WB / EU / IFAD	2011	2019	55,000,000	0	0	The development objective of Productive Partnerships in Agriculture Project for Papua New Guinea is to improve the livelihoods of smallholder cocoa and coffee producers supported by the project.	Institutional Strengthening and Industry Coordination:(Cost \$13.70 M) Productive Partnerships:(Cost \$21.10 M) Market Access Infrastructure:(Cost \$20.20 M)
Support to Rural Entrepreneurship and Trade in Papua New Guinea	EU	0	0	97,000,000	FAO	0	0	The planned programme is in the design phase but is anticipated to target two specific objectives, developing three specific sustainable market orientated rural development activities (cocoa, vanilla, and inshore reef fisheries) in East Sepik and Sandaun provinces, and establish strong and efficient value chain enablers including infrastructure and policy environment.
The Market for Village Farmers – Maket Bilong Vilis Fama	IFAD	2019	2025	50,260,000	0	DAL/FPDA	0	The project will target six provinces of PNG. Activities related to the fresh produce sub-sector will be implemented in four provinces in the Highlands Region (Western Highlands, Jiwaka, Simbu and Eastern Highlands) and one province in the Momase Region, Morobe. Galip nut related activities will be implemented in East New Britain. MVF targets around 25,000 farming households, benefiting approximately 125,000 people

Existing and Planned Finance: REDD+ Coordination

Name	Source	Start Date	End date	Budget	Implementing partner	Government agency	Target outcomes	Key Activities
REDD Coordination								
Forest Carbon Partnership Facility REDD+ Readiness (FCPF) Phase 1	WB	2015	2018	3,800,000	UNDP	CCDA / PNGFA	First phase of project supporting REDD+ Readiness activities in PNG	Support to development and coordination of national REDD+ activities including NRS development, safeguards and support to REDD+ monitoring and reporting.

Forest Carbon Partnership Facility REDD+ Readiness (FCPF) Phase 2	WB	2016	2020	5,200,000	UNDP	CCDA / PNGFA	First phase of project supporting REDD+ Readiness activities in PNG	Support to development and coordination of national REDD+ activities including NRS development, safeguards and support to REDD+ monitoring and reporting.
Enhancing capacity to develop a sustainable GHG inventory system for PNG	JICA	2017	2021	-	JICA	CCDA	0	this technical cooperation initiative is working with CCDA to support capacity prepare transparent, accurate, consistent, comparable and complete GHG inventories. It is focused on supporting Capacity to periodically and systematically prepare the national GHG inventories including implementation of QA/QC procedures is enhanced. Capacity to promote understanding of national GHG inventories, capacity to technically assess the GHG inventory and to make improvements is enhanced for each sector (energy, industrial processes, agriculture, land use, land-use change and forestry, waste).
Preparation of Papua New Guinea's Initial Biennial Update Report to UNFCCC and the Third National Communication Report to the UNFCCC	GEF	2015	0	877,000	UNDP	CCDA	0	To prepare and submit Papua New Guinea's Third National Communication (3NC) and the first biennial update report (BUR) to UNFCCC
Reporting for Results-based REDD+ (RRR+)	Italian Government	2016	2019	-	CDKN / Cfrn	CCDA	0	The Reporting for Results-based REDD+ project is a three-year project to build capacity for measuring reductions in greenhouse gas emissions and enhancement of carbon stocks in agriculture, forest and other land use in 21 tropical and subtropical forest countries.
Strengthening capacity in the agriculture and land-use sectors for enhanced transparency in implementation and monitoring of Nationally Determined Contributions (NDCs) under the Paris Agreement in Papua New Guinea	GEF	0	0	2,463,242	0	0	0	By 2020 PNG is preparing reports to the UNFCCC under the Paris Agreement Enhanced Transparency Framework (ETF) with strengthened agriculture and land use sector components including inventories of emissions by sources and sinks, and information necessary to track progress against priority actions identified in PNG's NDC for these sectors.
Other								

Rural Service Delivery Project	WB	2017	2022	28,000,000	0	0	The development objective of the Rural Service Delivery Project for Papua New Guinea is to improve communities' access to basic infrastructure and services in targeted rural areas using inclusive, participatory planning, and implementation.	The first component, preparation and implementation of sub-projects consists of following sub-components: (i) ward development grants; and (ii) subproject preparation and implementation support grants. The second component, capacity building of national and sub-national entities will support the strengthening of capacities of national and sub-national government entities as well as community members to manage and implement subprojects, and to improve local governance as it relates to basic service delivery. The third component, project management will finance incremental costs of the implementing agency for project management, specifically coordination and supervision of implementation activities, financial management, annual audits, and monitoring and evaluation.
PNG Tourism Sector Development Project	WB	2017	2022	20,000,000	0	Tourism Promotion Authority	The objective of the Tourism Sector Development Project for Papua New Guinea is to improve tourism services in targeted destinations.	There are three components to the project, the first component being institutional and policy frameworks. This component will seek to raise the standard of government entities integral to establishing and growing an effective tourism sector. Institutional strengthening and integrated planning at the national level, the provincial level (in East New Britain and Milne Bay), and the local level (in Kokopo, Rabaul and Alotau), will enable entities to carry out key priorities such as: improved destination planning and management; marketing and promotion; skilled workforce development and capacity building; product development; sustainable site management of tourism assets; and performance monitoring and evaluation activities.
Papua New Guinea Development Policy Operation	WB	2018	2020	150,000,000	0	0	The development objectives: (i) strengthen fiscal management and revenue performance; and (ii) strengthen key building blocks for public financial management and financial inclusion.	The operation supports four key components of the government's development program, as articulated in the Alotau Accord II, Medium-Term Fiscal Strategy (MTFS), Medium-Term Revenue Strategy (MTRS) and the existing Medium-Term Development Plan II 2016-2017. The first component is fiscal management, where the government aims to improve fiscal resilience to resource-based volatility by establishing the non-resource primary balance as a medium-term fiscal anchor. The second is revenue mobilization, where the government aims to reverse the recent declining trend in tax revenue to Gross Domestic Product (GDP) by broadening the tax base, providing clear revenue administration legislation, and operating a fair and efficient revenue administration. The third is public financial management (PFM) reform, where the government aims to continue the implementation of the PEFA Road Map 2015-2018, within which the rollout of the IFMS is among the highest priorities. The fourth is gender equality, where the government aims to support the economic empowerment of women

Existing and Planned Finance: Other potentially REDD+ aligned areas

Name	Source	Start Date	End date	Budget	Implementing partner	Government agency	Target outcomes	Key Activities
Other								
Rural Service Delivery Project	WB	2017	2022	28,000,000	0	0	The development objective of the Rural Service Delivery Project for Papua New Guinea is to improve communities' access to basic infrastructure and services in targeted rural areas using inclusive, participatory planning, and implementation.	The first component, preparation and implementation of sub-projects consists of following sub-components: (i) ward development grants; and (ii) subproject preparation and implementation support grants. The second component, capacity building of national and sub-national entities will support the strengthening of capacities of national and sub-national government entities as well as community members to manage and implement subprojects, and to improve local governance as it relates to basic service delivery. The third component, project management will finance incremental costs of the implementing agency for project management, specifically coordination and supervision of implementation activities, financial management, annual audits, and monitoring and evaluation.
PNG Tourism Sector Development Project	WB	2017	2022	20,000,000	0	Tourism Promotion Authority	The objective of the Tourism Sector Development Project for Papua New Guinea is to improve tourism services in targeted destinations.	There are three components to the project, the first component being institutional and policy frameworks. This component will seek to raise the standard of government entities integral to establishing and growing an effective tourism sector. Institutional strengthening and integrated planning at the national level, the provincial level (in East New Britain and Milne Bay), and the local level (in Kokopo, Rabaul and Alotau), will enable entities to carry out key priorities such as: improved destination planning and management; marketing and promotion; skilled workforce development and capacity building; product development; sustainable site management of tourism assets; and performance monitoring and evaluation activities.

Papua New Guinea Development Policy Operation	WB	2018	2020	150,000,000	0	0	The development objectives: (i) strengthen fiscal management and revenue performance; and (ii) strengthen key building blocks for public financial management and financial inclusion.	The operation supports four key components of the government's development program, as articulated in the Alotau Accord II, Medium-Term Fiscal Strategy (MTFS), Medium-Term Revenue Strategy (MTRS) and the existing Medium-Term Development Plan II 2016-2017. The first component is fiscal management, where the government aims to improve fiscal resilience to resource-based volatility by establishing the non-resource primary balance as a medium-term fiscal anchor. The second is revenue mobilization, where the government aims to reverse the recent declining trend in tax revenue to Gross Domestic Product (GDP) by broadening the tax base, providing clear revenue administration legislation, and operating a fair and efficient revenue administration. The third is public financial management (PFM) reform, where the government aims to continue the implementation of the PEFA Road Map 2015-2018, within which the rollout of the IFMS is among the highest priorities. The fourth is gender equality, where the government aims to support the economic empowerment of women
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Annex 3. Emission reduction estimates

Annex under development.

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