



Integrated land management, restoration of degraded landscapes and natural capital assessment in the mountains of Papua New Guinea

Part I: Project Information

GEF ID

10580

Project Type

FSP

Type of Trust Fund

GET

CBIT/NGI

CBIT **No**

NGI **No**

Project Title

Integrated land management, restoration of degraded landscapes and natural capital assessment in the mountains of Papua New Guinea

Countries

Papua New Guinea

Agency(ies)

UNEP

Other Executing Partner(s)

Conservation and Environment Protection Authority (CEPA), Government of Papua New Guinea

Executing Partner Type

Government

GEF Focal Area

Multi Focal Area

Taxonomy

Focal Areas, Biodiversity, Financial and Accounting, Natural Capital Assessment and Accounting, Biomes, Tropical Rain Forests, Mainstreaming, Agriculture and agrobiodiversity, Certification -National Standards, Forestry - Including HCVF and REDD+, Land Degradation, Sustainable Land Management, Restoration and Rehabilitation of Degraded Lands, Sustainable Livelihoods, Ecosystem Approach, Sustainable Agriculture, Integrated and Cross-sectoral approach, Improved Soil and Water Management Techniques, Land Degradation Neutrality, Land Productivity, Land Cover and Land cover change, Carbon stocks above or below ground, Climate Change, Influencing models, Demonstrate innovative approach, Transform policy and regulatory environments, Strengthen institutional capacity and decision-making, Deploy innovative financial instruments, Stakeholders, Private Sector, Individuals/Entrepreneurs, SMEs, Large corporations, Capital providers, Type of Engagement, Information Dissemination, Participation, Partnership, Communications, Awareness Raising, Education, Public Campaigns, Indigenous Peoples, Local Communities, Civil Society, Community Based Organization, Non-Governmental Organization, Academia, Beneficiaries, Gender Equality, Gender results areas, Access and control over natural resources, Capacity Development, Access to benefits and services, Gender Mainstreaming, Sex-disaggregated indicators, Women groups, Gender-sensitive indicators, Capacity, Knowledge and Research, Knowledge Generation, Enabling Activities

Sector

Mixed & Others

Rio Markers

Climate Change Mitigation

Climate Change Mitigation 1

Climate Change Adaptation

Climate Change Adaptation 0

Submission Date

1/17/2022

Expected Implementation Start

1/1/2023

Expected Completion Date

12/31/2027

Duration

60In Months

Agency Fee(\$)

333,650.00

A. FOCAL/NON-FOCAL AREA ELEMENTS

Objectives/Programs	Focal Area Outcomes	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
BD-1-3	Mainstream biodiversity across sectors as well as landscapes and seascapes through Natural Capital Assessment and Accounting	GET	1,320,053.00	2,731,340.00
LD-1-1	Maintain or improve flow of agro-ecosystem services to sustain food production and livelihoods through Sustainable Land Management	GET	743,124.00	7,553,170.00
LD-1-2	Maintain or improve flow of ecosystem services, including sustaining livelihoods of forest-dependent people through Sustainable Forest Management	GET	822,999.00	7,825,946.00
LD-2-5	Create enabling environments to support scaling up and mainstreaming of SLM and LDN	GET	625,924.00	1,489,535.00
Total Project Cost(\$)			3,512,100.00	19,599,991.00

B. Project description summary

Project Objective

To achieve biodiversity conservation and land degradation neutrality in the Southern Highlands and Hela Provinces of Papua New Guinea through integrated landscape management and natural capital assessment

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
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Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
Component 1. Enabling environment to support the flow of ecosystem goods and services and achieve land degradation neutrality (LDN)	Technical Assistance	<p>Outcome 1.1: Improved policies and legal framework for integration of natural capital valuation into land use planning adopted and implemented at the national level to support the flow of ecosystem services and LDN</p> <p>Measured through:</p> <p>Indicator 1.1.1. Proportion of adopted policy, legal and regulatory instruments on land use planning that support an enabling environment for SLM, SFM and NCA (Baseline: TBD / Target: 70% of instruments in force/enacted)</p> <p>Indicator 1.1.2. Number of land use</p>	<p>Output 1.1.1. A review of policies, legislation, and procedures to integrate natural capital values and sustainable land management principles into land use planning is available is available to stakeholders</p> <p>Output 1.1.2: Stakeholders can access environmental assessment to feed into land use planning.</p> <p>Output 1.1.3: Conservation and Environment Protection Authority and other relevant central and provincial government agencies benefit from gender-responsive capacity and knowhow development for environmental assessment, compliance monitoring, and enforcement.</p> <p>Output 1.1.4. Natural capital valuation reports with scenario</p>	GET	767,000.00	1,833,131.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
Component 2. Natural capital valuation and implementation of sustainable land and forest management (SLM/SFM) practices in mountain landscapes of the Southern Highlands and Hela Provinces	Technical Assistance	<p>Outcome 2.1: Mountain landscapes in the Southern Highlands and Hela Provinces managed sustainably by linking valuation of natural capital, land use planning and SLM/SFM with development policy and financial incentives to reduce degradation, move towards LDN and restore ecosystem services</p> <p>Measured through:</p> <p>Indicator 2.1.1. Number of landowners and farmers disaggregated by sex reporting the adoption of SLM/SFM technologies promoted by the Project (Baseline: 0 / Target: 18,000 of whom 10,000 women)</p> <p>Indicator 2.1.2.</p>	<p>Output 2.1.1. SLM practices through restored soil fertility, improved income, and environmentally sound production demonstrated to landowners and farmers.</p> <p>Output 2.1.2. Communities benefit from community-based restoration of degraded forests through SFM and agroforestry.</p> <p>Output 2.1.3. Gender-sensitive strategies for SLM and SFM demonstrated at project sites to foster women's livelihood improvement.</p> <p>Output 2.1.4. Stakeholders benefit from piloted sustainable financing mechanisms for LDN to incentivize land restoration.</p>	GET	1,893,100.00	16,414,116.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
Component 3. Knowledge management, monitoring and evaluation, awareness raising and training	Technical Assistance	<p>Outcome 3.1: Project results disseminated enabling scaling up and supporting land use planning, ecosystem good and services, and LDN</p> <p>Measured through:</p> <p>Indicator 3.1.1: Increase in use of capacities in practically applying SLM, SFM and the value of biodiversity in land use among targeted beneficiaries, disaggregated by sex (Baseline: TBD / Target: 20% improvement for both f/m)</p> <p>Indicator 3.1.2: Number of businesses integrating NCA in business planning and operations as a result of project intervention, disaggregated by sex of owner</p>	<p>Output 3.1.1. Effective results-based adaptive management and dissemination of results supported by participatory monitoring and evaluation system</p> <p>Output 3.1.2. Stakeholders effectively absorb knowledge and best practices emerging from the project to implement SLM and SFM.</p> <p>Output 3.1.3. Landowners and communities benefit from gender responsive capacity building on SLM and SFM in local languages.</p> <p>Output 3.1.4. Small and medium sized enterprises are able to integrate natural capital valuation and SLM principles into feasibility plans and business models.</p>	GET	686,000.00	293,834.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
				Sub Total (\$)	3,346,100.00	18,541,081.00
Project Management Cost (PMC)						
GET			166,000.00		1,058,910.00	
Sub Total(\$)			166,000.00		1,058,910.00	
Total Project Cost(\$)			3,512,100.00		19,599,991.00	

Please provide justification

C. Sources of Co-financing for the Project by name and by type

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
Recipient Country Government	Conservation and Environment Protection Authority	In-kind	Recurrent expenditures	1,233,285.00
Recipient Country Government	Conservation and Environment Protection Authority	Grant	Investment mobilized	857,500.00
Recipient Country Government	Department of Lands and Physical Planning	In-kind	Recurrent expenditures	100,000.00
Recipient Country Government	Department for Community Development and Religion	In-kind	Recurrent expenditures	301,206.00
Recipient Country Government	Department of National Planning and Monitoring	Public Investment	Investment mobilized	10,250,000.00
Recipient Country Government	Department of Agriculture and Livestock	In-kind	Recurrent expenditures	1,000,000.00
Recipient Country Government	Department of Agriculture and Livestock	Grant	Investment mobilized	5,245,000.00
Private Sector	Oil Search Limited	In-kind	Recurrent expenditures	50,000.00
Recipient Country Government	National Agricultural Research Institute	In-kind	Recurrent expenditures	80,000.00
Recipient Country Government	Papua New Guinea Forest Authority	In-kind	Recurrent expenditures	483,000.00
Total Co-Financing(\$)				19,599,991.00

Describe how any "Investment Mobilized" was identified

*To identify ?Investment Mobilized?, potential partners were invited to indicate (i) the portion of their approved budget that will go to support the goals of the proposed project and (ii) the proportion from the identified amounts that will be used towards recurrent and operational expenditures, such as salaries, office space, utilities, etc. The sub-set of Co-Financing that meets the definition of ?Investment Mobilized? was then identified by the Implementing Agency by removing the amounts for recurrent and operational expenditures.

D. Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
UNEP	GET	Papua New Guinea	Land Degradation	LD STAR Allocation	2,192,047	208,245	2,400,292.00
UNEP	GET	Papua New Guinea	Biodiversity	BD STAR Allocation	1,320,053	125,405	1,445,458.00
Total Grant Resources(\$)					3,512,100.00	333,650.00	3,845,750.00

E. Non Grant Instrument

NON-GRANT INSTRUMENT at CEO Endorsement

Includes Non grant instruments? **No**

Includes reflow to GEF? **No**

F. Project Preparation Grant (PPG)

PPG Required **true**

PPG Amount (\$)

150,000

PPG Agency Fee (\$)

14,250

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
UNEP	GET	Papua New Guinea	Land Degradation	LD STAR Allocation	99,999	9,500	109,499.00
UNEP	GET	Papua New Guinea	Biodiversity	BD STAR Allocation	50,001	4,750	54,751.00
Total Project Costs(\$)					150,000.00	14,250.00	164,250.00

Core Indicators

Indicator 3 Area of land restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
50000.00	39667.00	0.00	0.00

Indicator 3.1 Area of degraded agricultural land restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
50,000.00	39,667.00		

Indicator 3.2 Area of Forest and Forest Land restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
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Indicator 3.3 Area of natural grass and shrublands restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
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Indicator 3.4 Area of wetlands (incl. estuaries, mangroves) restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
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Indicator 4 Area of landscapes under improved practices (hectares; excluding protected areas)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
50000.00	44742.00	0.00	0.00

Indicator 4.1 Area of landscapes under improved management to benefit biodiversity (hectares, qualitative assessment, non-certified)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
25,000.00	23,214.00		

Indicator 4.2 Area of landscapes that meets national or international third party certification that incorporates biodiversity considerations (hectares)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Type/Name of Third Party Certification

Indicator 4.3 Area of landscapes under sustainable land management in production systems

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
25,000.00	21,528.00		

Indicator 4.4 Area of High Conservation Value Forest (HCVF) loss avoided

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Documents (Please upload document(s) that justifies the HCVF)

Title	Submitted

Indicator 6 Greenhouse Gas Emissions Mitigated

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO ₂ e (direct)	733333	7024789	0	0
Expected metric tons of CO ₂ e (indirect)	5128365	0	0	0

Indicator 6.1 Carbon Sequestered or Emissions Avoided in the AFOLU (Agriculture, Forestry and Other Land Use) sector

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO ₂ e (direct)	733,333	7,024,789		

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO ₂ e (indirect)	5,128,365			
Anticipated start year of accounting	2022	2023		
Duration of accounting	20	20		

Indicator 6.2 Emissions Avoided Outside AFOLU (Agriculture, Forestry and Other Land Use) Sector

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO ₂ e (direct)				
Expected metric tons of CO ₂ e (indirect)				
Anticipated start year of accounting				
Duration of accounting				

Indicator 6.3 Energy Saved (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)

Total Target Benefit	Energy (MJ) (At PIF)	Energy (MJ) (At CEO Endorsement)	Energy (MJ) (Achieved at MTR)	Energy (MJ) (Achieved at TE)
Target Energy Saved (MJ)				

Indicator 6.4 Increase in Installed Renewable Energy Capacity per Technology (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)

Technology	Capacity (MW) (Expected at PIF)	Capacity (MW) (Expected at CEO Endorsement)	Capacity (MW) (Achieved at MTR)	Capacity (MW) (Achieved at TE)

Indicator 11 Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Female	25,000	12,000		
Male	25,000	10,000		
Total	50000	22000	0	0

Provide additional explanation on targets, other methodologies used, and other focal area specifics (i.e., Aichi targets in BD) including justification where core indicator targets are not provided

* The numbers were derived from the figures of the targeted landscapes obtained from the 2011 population census data. More women were identified among the targeted beneficiaries of the Project, as they are more likely to be engaged in agriculture, and because the Project wants to disproportionately favour them as beneficiaries of livelihood interventions. The Project's beneficiaries include landowners and farmers in the targeted landscapes; disadvantaged community members; women's and youth groups working on land and natural resources; agricultural Small and Medium Enterprises, both informal and registered; large extractive industries; the general population of the targeted Local Level Government (LLG) administrative units; banks and financial institutions; land-based government departments and their officials at the national level as well as their field staff at the Provincial, District and LLG levels; members of the provincial administrations; as well as local Non-Government Organizations (NGOs) involved in the project. All stakeholder categories will benefit from project interventions under Outcome 3. All, but financial institutions, and the public of the targeted LLGs will benefit from project investments under Outcome 2. Government departments, landowners and farmers, the population of the targeted LLGs, provincial authorities, and large extractive industries will be the primary beneficiaries of project activities under Outcome 1.

Part II. Project Justification

1a. Project Description

1) Global environmental problems, root causes and barriers

Global environmental problem

Papua New Guinea (PNG) is one of the 17 megadiverse countries in the World that hosts approximately 5% of global biodiversity. As one of the five High-Biodiversity Wilderness Areas in the World, the island of New Guinea is a critical global biodiversity conservation priority. New Guinea is the largest tropical island in the world with 785,750 km². Given its size, the high altitude variation and diverse soils, topography, and climates, the island harbours unique life zones that cannot be found elsewhere in the tropics. The island also houses the third-largest intact tropical forest in the world, after the Amazon and Congo Basins. Vast land and natural resources identify PNG as one of the biggest ecological creditors in terms of per capita biocapacity.

Yet, these globally outstanding assets are threatened by biodiversity loss and land degradation, including the loss of forests. From 2002 to 2020, Papua New Guinea lost 777,000 hectares of humid primary forest, which amounts to 2.4% of the baseline. 13% of close canopy forests had been logged at least once between 1972 and 2014 and 4.1% of forest was cleared or logged between 2002 and 2014. Forest loss accelerated substantially since then, amounting to 45-80,000 ha of humid primary forest loss annually. The accelerated rate of deforestation confirms PNG's location on the forest transition curve from core forests to frontier areas. Most tree cover loss in PNG was attributed to subsistence agriculture, followed by forestry, fires, and commodities. Between 1972 and 2002, 12.06% of forests were lost due to deforestation and degradation in Southern Highlands Province (combination of present-day Southern Highlands and Hela Provinces), most of it due to subsistence agriculture. Besides forest loss and degradation, other forms of land degradation pose serious environmental problems. PNG's arable land per capita is 0.15 hectare per capita, substantially below the world average of 0.25. Land degradation is significant at the global level and affects substantial areas of the country, including parts of the Highlands. Between 2000 to 2014, 2,259,922 hectares of land were degraded in the Highlands Region.

Forest loss and land degradation goes hand in hand with biodiversity loss. PNG has 1,571 known species of amphibians, birds, mammals and reptiles, and at least 11,544 species of vascular plants. According to IUCN Red List, there are 1,564 species in Papua New Guinea listed under various threat categories, and the vast majority show a decreasing trend. A comprehensive assessment of the drivers of biodiversity loss in PNG identified high biodiversity threats as: clear-cutting, commercial agroforestry, selective cutting, invasive species, pollution, harvest volumes and mineral extraction. Medium biodiversity threats are listed as: rates of harvest, subsistence agriculture, oil and gas extraction, subsistence hunting, wood fuel harvesting, and infrastructure development. Of these, only the impacts of logging are being monitored through the PNG Forest Authority (PNGFA).

The root causes include a demographic boom, very low human development, challenging tribal land tenure and related conflicts, as well as limited local economic development opportunities, particularly for women that are confined to low-productivity agriculture. These in turn are linked to proximate drivers that cause land degradation and biodiversity loss of accelerated pace particularly in the Highlands region. The most important threats in the context of the Project include logging, subsistence and commercial agriculture, extraction on non-renewables, fire, climate change, invasive species, and unsustainable hunting.

Exacerbating biodiversity loss and land degradation, PNG ranks among the World's 20 most vulnerable countries to the impacts of climate change. IPCC climate projections under the A1B emission scenario forecast <1°C temperature rise until 2030, and >2.5°C until 2090, along with moderate to substantial increases in seasonal and annual precipitation, coupled with an increase in extreme events. Within that, the Highlands are expected to be hit harder as compared to the coastal areas.

Subsistence agriculture: Subsistence agriculture primarily practiced as shifting cultivation (locally called 'gardening') is the most important cause of deforestation and forest degradation in the Highlands. However, the shortening of fallow periods due to increasing pressure results in a gradual transition to permanent agriculture. The underlying cause for the expansion of subsistence agriculture is the rapidly increasing population of the Highlands that makes up 43% of PNG's population, concentrated on only 13.5% of its territory. In addition, the mining and hydrocarbon extraction industries and demand for sweet potato in large urban areas such as Port Moresby additionally drive food demand and thereby the expansion and intensification of agriculture in the Highlands. These indirect drivers translate to direct drivers that include (i) improper management of annual, perennial, shrub, and tree crops, (ii) improper soil management, (iii) cropping on steep slopes and erosion, (iv) overexploitation of vegetation for domestic use, and (v) over-grazing. The forest area cleared annually for shifting cultivation is estimated to range between 150,000 and 200,000 hectares and, in total, approximately 6 million hectares are used in the shifting cultivation cycle. The land which is most at risk of degradation is i) land cleared and subsequently utilized continuously, ii) land with inadequately short fallow periods to allow recovery, and iii) shifting cultivation on steep slopes prone to erosion. Particularly women are left with few other economic opportunities than practicing subsistence agriculture.

Internal conflicts: Though latent conflicts existed in present territory of Hela and Southern Highlands Provinces (former joint Southern Highlands Province) prior to the 1990s, large-scale resource extraction of hydrocarbon deposits saw conflicts elevate to a substantially higher scale. These conflicts are largely related to the mismanagement and misappropriation of government funds and of oil and gas revenues, along with inequitable access to benefits of oil and gas royalties and to benefits brought by development projects. The conflicts are further exacerbated by ethnic divisions, lack of effective governance, and unrealistic expectations about development.

Extraction of non-renewables: Extractive industries are of particular importance for Hela and Southern Highlands Provinces, since the Kikori River Basin that contains most of these provinces also contains PNG's largest oil and gas deposits. Of PNG's five principal oil and gas fields, 99.2% of production was generated by the PNG Liquefied Natural Gas (LNG) Project operating in the Kikori River Basin in 2018. There are no large mines operating within Hela and Southern Highlands Provinces, though confirmed gold deposits exist in Koroba and elsewhere, and mining exploration licenses cover the entire north-eastern fringe of the two provinces. This poses substantial threats, given the very poor environmental and resource governance record of mining in PNG.

Logging: As timber resources elsewhere in Southeast Asia have dwindled, the forests of PNG have increasingly come under pressure from industrial logging. Over the past five decades, industrial logging has been the main cause of deforestation and forest degradation in the country. 97% of timber exports are logs and 87% of exports go to China, the vast majority from illegal logging. The risk of illegality of timber sourced from PNG has independently been assessed as very high (timber risk score of 3 out of 10). Though logging has primarily impacted the Lowlands, Mount Giluwe was subject to extensive logging in the 1980 and 1990s. In addition, recent years have seen expansion of logging licenses across the Highlands, including in Southern Highlands and Hela Provinces. Timber concessions are located in the east of Southern Highlands Province and contain an estimated 3.76 million m³ of timber to be harvested, which makes up 79.3% of the entire remaining timber to be harvested in logging concessions across the Highlands Region. In addition, Special Agriculture and Business Leases (SABLs) have been mainly used for logging and not for expanding agricultural activities throughout the country.

Commercial agriculture: Though 83% of agricultural land is used for subsistence, commercial agriculture, primarily for palm oil, coconut, coffee, cocoa, tea, and others make up substantial

proportions across PNG. While the proportion of agricultural land used for commercial agriculture is limited in the Highlands as compared to the Lowlands, commercial agriculture has expanded rapidly in recent years. Robusta and arabica coffee, indigenous food crops, vanilla, sheep, cattle, and exotic food crops and spices (including chili) were identified as high potential agricultural commodities for Hela and Southern Highlands Provinces, of which coffee cultivation has seen rapid expansion. Commercial agriculture and logging are responsible for the current deforestation 'hotspots' in PNG by obtaining (SABL) over forested areas of customary land. SABLs are essentially land concessions, and the land can be cleared for agricultural or other developments. Only minor areas in Southern Highlands Province are under SABLs, though the entire part of the Western Province adjacent to Hela and Southern Highlands is under SABLs.

Fire: Though fire is not a major threat, it nevertheless has regional significance as a threat to biodiversity and sustainable land management. Primarily anthropogenic fires are frequent and occur in connection with shifting cultivation, commercial agriculture, and logging. The likelihood of devastating fires increases substantially with El Niño events. Most fires occur within 6 km distance from settlements.

Climate change: Montane cloud forests in the Highlands are particularly vulnerable to climate change, as the cloud layer is expected to shift upwards leading to longer and more extreme dry seasons despite an overall increase in precipitation. As a result, vegetation zones are expected to shift in altitude, limiting the ranges and leading to local extinctions of many species, particularly of terrestrial vertebrates. Additionally, food shortages due to frost events are significant.

Invasive species: The threat of invasive species is subordinate, but nevertheless significant. Information on the number of established invasive species is not available but is estimated to be low. In the Highlands, introduced exotic fish species pose a threat after they have become naturalized in river systems across the Highlands. These include two species of tilapia (*Oreochromis niloticus* and *O. randalli*) as well as Rainbow Trout (*Oncorhynchus mykiss*) and Brown trout (*Salmo trutta*). Important invasive plants in the Highlands include giant cane (*Arundo donax*), and elephant grass (*Cenchrus purpureus*) initially introduced as livestock fodder, as well as spiked pepper (*Piper aduncum*), grown as hedge, and Japanese sunflower (*Tithonia diversifolia*).

Hunting: Hunting is a traditional land use practice exercised by men. The primary species hunted in Hela and Southern Highlands Provinces include ground cuscus (*Phalanger gymnotis* - LC), New Guinea quoll (*Dasyurus albopunctatus* - NT), common bush wallaby (*Thylogale bruijini*), painted ringtail possum (*Pseudocheirus forbesi* - LC), Doria's tree kangaroo (*Dendrolagus dorianus* - VU), copper ringtail possum (*Pseudocheirus cupreus*), golden ringtail possum (*Pseudocheirus corinnae*), long-beaked echidna (*Zaglossus bruijini* - CR), Stein's cuscus (*Phalanger vestitus* - LC), and mountain cuscus (*Phalanger carmelitae* - LC). Birds are also extensively hunted for their plumes and for trade. Limited information exists on sustainable offtake levels, but it is estimated that hunting levels are generally unsustainable.

Root causes

The multiple root causes that lead to the main environmental problem are presented in Figure 15. Different land-based production sectors continue to pursue an uncoordinated sectoral approach to land management. At the same time, challenging land tenure leads to conflicts between and within neighboring landowning tribes and clans. Traditional patriarchal societal norms and traditional land tenure prevents women from effectively participating in land use decisions and from reaping adequate benefits from land management. There is very limited information on Sustainable Land Management (SLM) and Sustainable Forest Management (SFM), which relates to the negligible interest on behalf of landowners to engage on SLM and SFM technologies. Capacities on both subjects are extremely limited, as summarized in Section 2.4 and Appendix 17. Climate change further exacerbates environmental degradation and biodiversity loss.

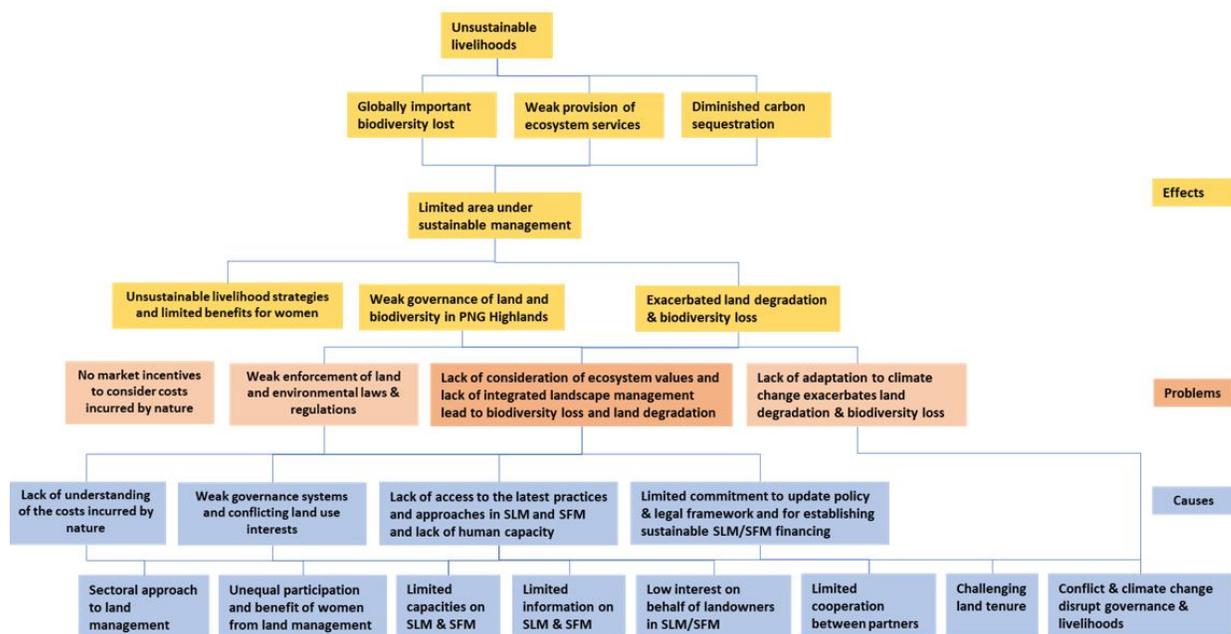


Figure 1: Problem tree

The root causes further lead to immediate causes, such as the lack of understanding of the costs incurred by nature, weak governance systems and conflicting land use interests, lack of access to the latest practices and approaches in SLM and SFM and lack of human capacity, and limited commitment to update and enforce the policy and legal framework and for establishing sustainable SLM/SFM financing. The root and immediate causes lead to several fundamental problems, which include the lack of market incentives to consider costs incurred by nature, weak enforcement of land and environmental laws & regulations, the lack of consideration of ecosystem values and lack of integrated landscape management, and inadequate adaptation to climate change. The compound problems lead to immediate effects, including unsustainable livelihoods strategies and limited benefits for women, weak governance of land and biodiversity in the PNG Highlands, and exacerbated land degradation and biodiversity loss. These sequentially lead to higher level effects including the loss of globally important biodiversity, the weak provision of ecosystem services, and diminished carbon sequestration, all of which ultimately result in unsustainable livelihoods.

Barriers

Despite the baseline interventions described in Section 2.6, fundamental barriers remain that prevent achieving LDN and halting the loss of biodiversity in the Highlands:

? Weak governance systems and conflicting land use interests: PNG's long-term development strategies and plans focused on achieving short-term growth and development, largely dependent on the extraction of non-renewable resources and the unsustainable use of natural assets, whilst negating the seriousness of the finite nature of non-renewable resources and irreversible damage to the environment. Recently, the focus on sustainable long-term development and the finiteness of revenues from non-renewable natural resources were recognized in PNG's Vision 2050 and Development Strategic Plan 2010-2030, which leads to exacerbating conflicting interests in land use. The country's three-tier government system accounts well for decentralization, however, is prone to institutional fragility and leads to the weak translation of policies into practice. These governance systems and institutional fragility remain major challenges affecting the agriculture sector. Despite good intentions,

the three tier levels of governments, and commodity boards and agencies have provided village farmers with little help to raise their productivity and to enable them to participate more effectively in commercial activities. Translation of new knowledge to business and commercial opportunities has been lacking for many years. Major crops, except for cocoa, coffee, and palm oil, have historically been marketed by statutory marketing boards, which may have impeded agricultural development through inefficiency and over-regulation. Lack of effective governance and management of customary land has transformed fertile lands into degraded and/or potentially degradable land. The invasion into degraded land by exotic grass species also has negative impacts on biodiversity and agricultural production. These scenarios are evident where human interference led to land transformation and in the absence of suitable land management intervention, eventually to further degradation.

? Lack of understanding of the cost incurred by nature: The lack of information and understanding on the true public and private value of natural capital assets leads to ill-informed economic decisions on behalf of policy makers, administrators, business ventures, and landowners on land and natural resources. For specific projects or activities, the lack of appropriate valuation of the cost incurred by nature makes it difficult for government agencies and companies to effectively price environmental externalities and integrate these natural costs into their calculation on the true cost of the product. The country has no regulations requiring companies to perform and disclose natural capital assessments during feasibility studies and implementation of their projects, and there is a lack of consistent data on natural inputs which can be used for developing replicable assessment frameworks. As a result, there are limited concrete valuations of natural capital available for policymakers to reach decisions in favour of sustainability. Monetary valuations of natural capital are rarely part of environmental impact assessments carried out by the private sector. Failure to understanding the cost incurred by nature and the monetary value to ecosystem goods and services hinder informed decision-making related to projects and activities that rely, directly or indirectly, on natural resources.

? Lack of access to the latest practices and approaches in SLM and SFM and lack of human capacity: PNG farmers and landowners suffer from a lack of sufficient and coherent information on the impacts of deforestation on soil quality and habitat degradation. While the traditional farming methods in PNG mountains have incorporated many land improvement techniques, these are being abandoned in favour short-term gains in productivity. Poor roads, geographical isolation and lack of awareness hamper farmers' access and exchange of resources and skills. There is little sharing of know-how and cooperation between researchers and farmers, and among farmers of different locations, to apply available good practices for SLM. Moreover, there are limited opportunities for farmers to access financial incentives and identify marketing opportunities.

2) Baseline scenario and any associated baseline projects

Baseline scenario

Climate change

The PNG Highland Provinces of Hela and Southern Highlands mostly fall within the Oceanic climate zone according to the Köppen climate classification.[1]¹ The provinces receive a total annual precipitation of 4,500 mm, most of which falls during the months of May to October. PNG's climate is dominated by the West Pacific Monsoon and year to year variation is substantial as a function of the El Niño Southern Oscillation. El Niño years are marked by cooler temperatures and delayed monsoon seasons. PNG ranks among the World's 20 most vulnerable countries to the impacts of climate change,[2]² and 80% of the country's population is susceptible to climate extremes linked to the El Niño Southern Oscillation.[3]³ PNG has experienced a 1°C warming of the mean annual temperature over the past 50 years, whereas no significant changes in annual precipitation could be observed. The past 20 years have seen an increase in the frequency of tropical cyclones. Climate projections under the International Panel on Climate Change (IPCC) moderate A1B emission scenario forecast <1°C temperature rise until 2030, and >2.5°C until 2090. Within that the Highlands are expected to be hit harder as compared to the coastal areas, including a disproportionate increase in the frequency and intensity of temperature extremes. Moderate to substantial increases in seasonal and annual precipitation are predicted, coupled with an increase in the frequency and intensity of days with extreme precipitation. Both, the frequency of droughts and of tropical cyclones is projected to decrease.[4]⁴ During the El Niño of 2015-16, frost and drought led to food insecurity for 2.2-2.4 million people, including in Hela and Southern Highlands Provinces.[5]⁵ In addition, PNG has the fourth highest percentage of population exposed to severe volcanic risk.

Biodiversity

PNG hosts the 3rd largest intact tropical rainforest, and 5th largest tropical forest in the World.[6]⁶ The country is further home to approximately 6-8% of the World's known biodiversity (equivalent to 400,000 ? 700,000 species), despite occupying only 0.5% of the global landmass.[7]⁷ PNG hosts 6% of the World's flora and about 60% of the species are endemic.[8]⁸ More than 800 species of birds (of which 131 are endemic), 352 species of amphibians, 335 species of reptiles and 298 species of terrestrial mammals (equivalent to 4.5% of all known terrestrial mammals), and 25,000-30,000 vascular plant species are reported from the country. As one of the last partially explored frontiers, 1060 new

species were discovered on the island of New Guinea between 1998 and 2008, including 218 plants, 580 invertebrates, 71 fishes, 132 amphibians, 43 reptiles, two birds and 12 mammals.[9]⁹

Most of the Highlands, including Hela and Southern Highlands Provinces are within the Central Range Papuan Montane Rainforests ecoregion that is located within the elevational belt of 1,000 to 3,000 m above mean sea level and forms part of the tropical and subtropical moist broadleaf forest belt.[10]¹⁰ These montane rainforests are floristically related to the mountain forests of South and Southeast Asia that are located at the transition between Laurasian and Gondwanan landmasses and are dominated by species of Lauraceae and Fagaceae. Within the ecoregion, lower montane forests dominate between 1,000 to approximately 1,500 to 2,500 m, dominated by *Castanopsis acuminatissima*, *Elaeocarpus* sp., and Lauraceae. Araucaria can form tall stands on ridges. Above 1,500 m, *Nothofagus* sp. dominates moss-covered upper montane cloud forests. Conifer dominated high mountain forests begin at approximately 2,500 m and are dominated by *Podocarpus* sp., *Dacrycarpus* sp., *Dacridium* sp., *Papuacedrus* sp., *Araucaria* sp., and *Libocedrus* sp. as well as Myrtaceae. Minor areas at high elevation on the slopes of Mount Giluwe fall within the Papuan Central Range Subalpine Grasslands that form part of the montane grasslands and savannas biome.[11]¹¹

The constituent mountain ranges of the Central Range are highly isolated, which led to extraordinary speciation within the Central Range. The biodiversity assets of Hela and Southern Highlands Provinces include extensive intact forests that host between 6,000 and 12,000 species of plants, over 700 species of terrestrial vertebrates with high level of endemism (at least 75 percent of non-volant mammals, 40 percent of birds and over 90 percent of frogs found in this region are endemic to the Island of New Guinea), and high diversity of birds-of-paradise and of amphibians. The Central Range Papuan Montane Rainforests are the global hotspot in terms of diversity of birds of paradise (15 species) the occurrence of which is mostly confined to this forest type. The forest type also hosts 100 endemic vertebrates, tree kangaroos, long-beaked echidnas, cassowaries (*Casuarius* sp.), and several marsupial species. The two provinces are home to New Guinea harpy-eagles (*Harpyopsis novaeguineae*), and vulturine parrots (*Gypopsitta vulturina*), to some of the World's rarest birds, the greater melampittas (*Melampitta* spp.), the World's longest lizard, the Salvadori monitor (*Varanus salvadorii*), and the World's second largest butterfly - the Goliath birdwing butterfly (*Ornithoptera goliath*). Despite more than 100 known endemic species of vertebrates, much of the biodiversity in Hela and Southern Highlands Provinces remains to be discovered. Biodiversity in Hela and Southern Highlands Provinces will be impacted disproportionately by climate change and a substantial loss of species richness, including of endemics is projected.[12]¹²

Six Key Biodiversity Areas (KBAs) totalling 374,500 hectares are located in the Southern Highlands and Hela Provinces: Mount Bosavi (25,000 ha), Lake Kutubu (24,000 ha), Mount Sisa (90,000 ha), NeTai Waranubu (30,000 ha), Hagen-Giluwe (200,000 ha) and Tamide (5,500 ha) (**Figure 2**).[13]¹³ These sites have been identified as KBAs based on the presence of significant populations of (i)

globally threatened species; (ii) species known only to be found in a particular biome and/or significant regional/sub-regional populations of trigger species; and/or (iii) endemic species known only to be found in a limited area. Species at risk found in these KBAs include several mammals: Bulmer's Fruit Bat (*Aproteles bulmerae*, IUCN Red List Category: CR),^[14] Goodfellow's Tree Kangaroo (*Dendrolagus goodfellowi* - EN), Western Long-beaked Echidna (*Zaglossus bruijnii* - CR) and Calaby's Pademelon (*Thylogale calabyi* - EN) and at least one plant species: *Nothofagus womersleyi* - EN). Key biodiversity values in the Project area are summarized as i) extensive intact forests, ii) high floristic diversity, iii) high faunal diversity, iv) endemic species, v) unique species assemblages, vi) species of conservation concern, and vii) biodiversity importance to local community for resource use and/or spiritual and cultural value.^[15] In addition, five Protected Areas exist in Southern Highlands Province, including Sulamesi, Lake Kutubu, Siwi-Utame, Libano-Hose, and Libano-Arisai communally managed Wildlife Management Areas (**Figure 2**).

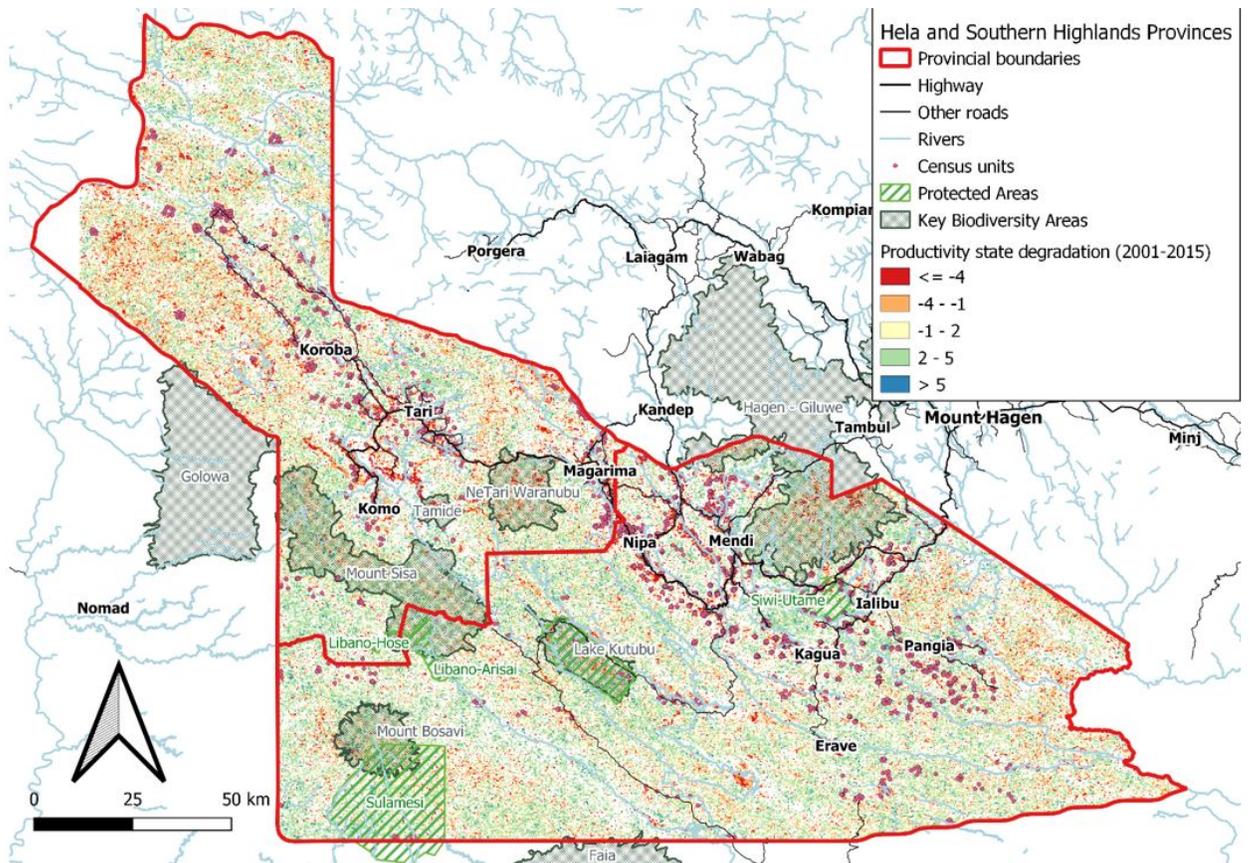


Figure 2: Protected Areas, Key Biodiversity Areas, settlements and land degradation in Hela and Southern Highlands Provinces (spatial data from PNG Data Portal,[16]¹⁶ World Database on Key Biodiversity Areas,[17]¹⁷ World Database on Protected Areas,[18]¹⁸ analysis of land degradation generated through QGIS Trends.Earth tool.[19]¹⁹

Several further priority areas that merit conservation action were identified in Hela and Southern Highlands Provinces, including the western flank of Mount Giluwe (simultaneously contained within Hagen-Giluwe KBA), northeast of Ialibu, north of Tari Gap including Ambua Peak, and the entire northeast of Tari Basin (Figure 3).[20]²⁰

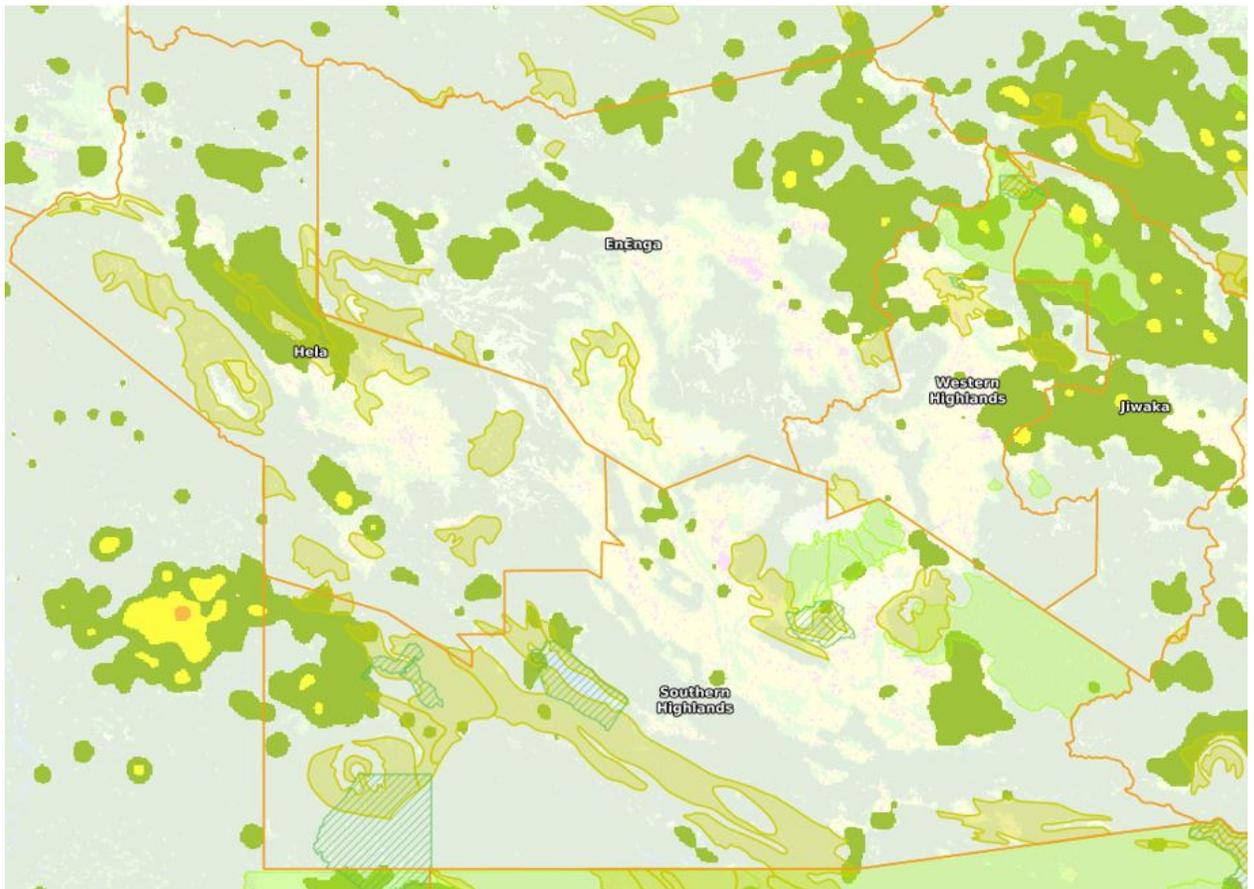


Figure 3: Areas of biodiversity conservation priority[21]²¹ (ocher green), existing Protected Areas (dashed green), logging concessions (light green) and deforestation hotspots (range of dark green = limited loss, to orange = high loss) in Hela and Southern Highlands Provinces. The background with high opacity displays the land use base map: forests in dark, agricultural areas in bright (from PNG REDD+ and Forest Monitoring Web-Portal)[22]²².

The PNG Highlands also harbour globally important agrobiodiversity: the sweet potato is a central component of the PNG diet, and an estimated 5,000 cultivars of this staple are found within the country. Numerous other plant species have traditionally been cultivated, including more than 30 root crops, 21 legume species, 40 leafy green vegetables, 60 other vegetables and roots, 43 varieties of nuts, 102 fruits, and 89 other plants used for food or for seasonings. This traditional knowledge has already been tapped by the outside world: the wing-bean (*Psophocarpus tetragonolobus*), which is nutritionally similar to the soybean and is an important part of the diet in PNG forest regions, is now cultivated in some 50 developing countries.[23]²³ All main staple food crop species and fruits and nut species of the country have been collected over the years and are now conserved in 'living collections' or field genebanks at various National Agriculture Research Institute (NARI) Centres throughout the country.

Land cover, land use and land degradation

The areas of Hela and Southern Highlands Provinces cover 10,498 km², 15,089 km², respectively. Of the cumulated area of 25,587 km² across the two provinces, forest cover makes up 72.5%. Scrub covers additional 11.3%, whereas grasslands and cleared land, including agricultural land occupy 14.6%.[24]²⁴ Grasslands are primarily located on and around Mount Giluwe (**Figure 5**). Tree cover is very high in both provinces and amounts to 97% in Hela and 95% in Southern Highlands Province.[25]²⁵

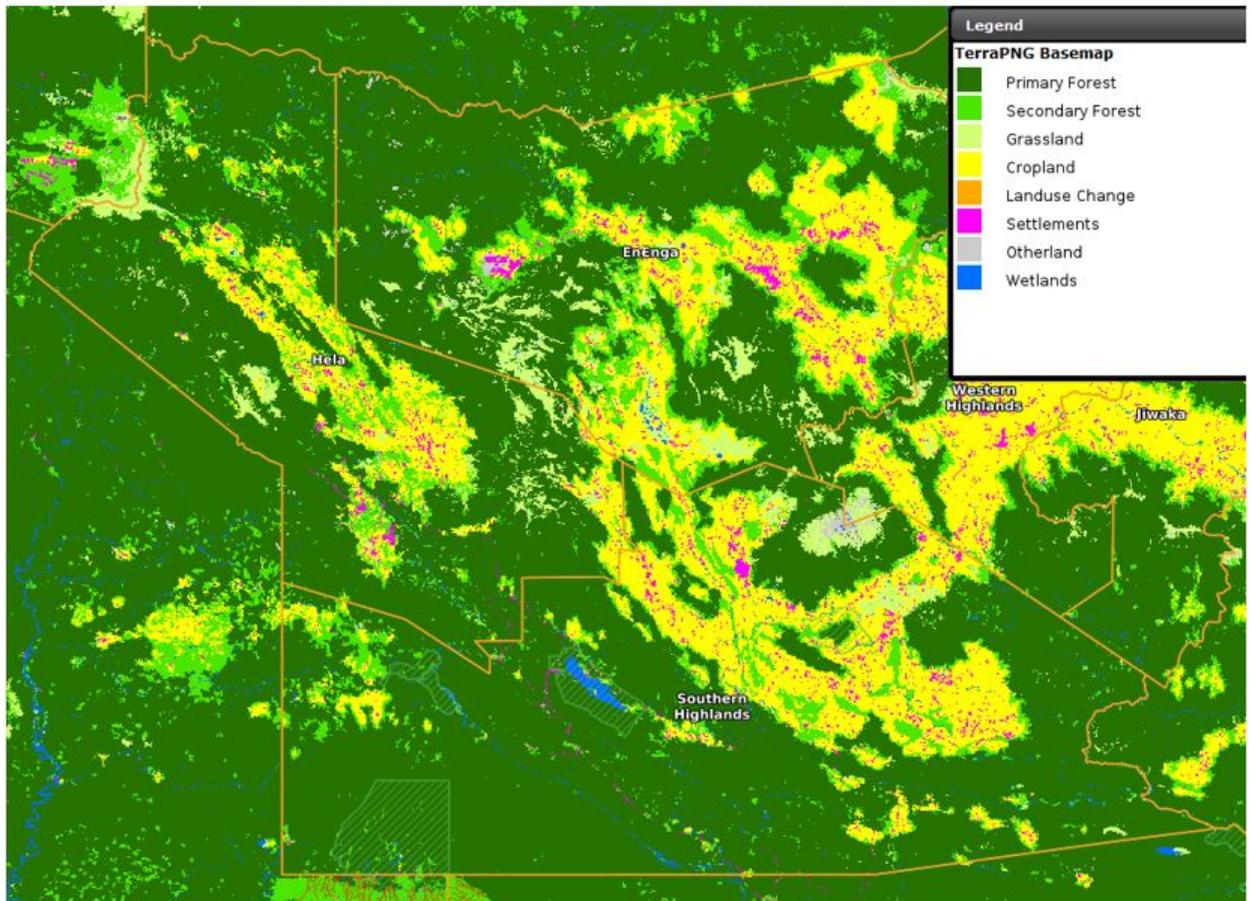


Figure 4: Land use map of Hela and Southern Highlands Provinces (from PNG REDD+ and Forest Monitoring Web-portal[26]²⁶).



FIGURE 5: LAND COVER MAP OF HELA AND SOUTHERN HIGHLANDS PROVINCES (FROM EARTHMAP.ORG).

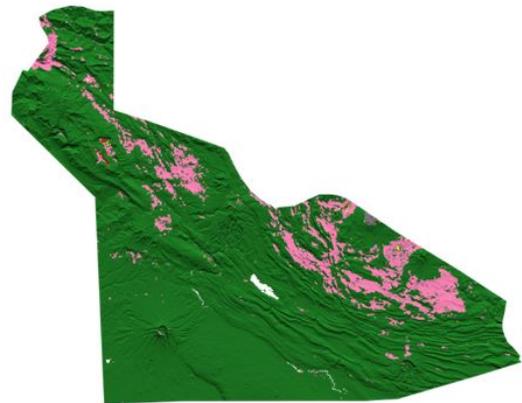


FIGURE 6: LAND USE MAP OF HELA AND SOUTHERN HIGHLANDS PROVINCES (FROM EARTHMAP.ORG).

The dominant land use type across the two provinces is forest land (**Figure 6**), consisting of unmanaged forests, traditionally managed forests, commercially managed forests, and forests reserved for biodiversity conservation. Commercial forestry is overseen by the PNG Forest Authority (PNGFA) under a system of logging concessions, most of which are operated by foreign companies and target the export of logs. Logging concessions are typically operated at unsustainable levels and are exhausted after a single logging cycle of 20 to 40 years. Harvesting is limited to trees of commercial species greater than 50 cm diameter at breast height, maintaining buffer zones along watercourses. Local landowners can opt to set up to 10% of a concession as a Protected Area, which is rarely made use of. First logging entries in PNG’s rainforests yield 10-20 m³ / ha of commercial timber.[27]²⁷ At present, two large areas in Southern Highlands Province are covered by forest concessions: the eastern side of Mount Giluwe and East Pangia along the border with Western Highlands and Chimbu Provinces. However, further large forest concessions are in preparation: Bosavi, covering Mount Bosavi; Hekiko covering the Darai Plateau; Kutubu-Poroma covering the entire area between Lake Kutubu and Poroma; West Mount Giluwe covering the western flanks of Mount Giluwe (all in Southern Highlands Province), and Nogoli in Hela Province. Just Bosavi and Hekiko concessions will cover the entire territory of Southern Highlands Province west of the Darai River, that is equivalent to the approximately 25% of the province’s area and contains Sulamesi Wildlife Management Area and Mount Bosavi KBA.[28]²⁸

The land use type of greatest socio-economic importance is cropland (**Figure 6**). Cropland is mostly used for subsistence agriculture, primarily practiced as shifting cultivation (locally termed

?gardening?), but commercial agriculture in the form of cash crop plantations is expanding rapidly. Shifting cultivation emerged as a sustainable system under low population densities and has defined an anthropogenically shaped landscape across the Highlands for 8,000 years. Smallholder farms are generally smaller than 5 hectares. The dominant traditional agricultural systems include intensive shifting cultivation growing sweet potato and other crops in the Tari Basin in Hela Province and around Mount Giluwe in the Southern Highlands Province. In the northwest of Hela and the east of Southern Highlands, low intensity shifting cultivation primarily focusing on sweet potato dominates. Around Lake Kutubu and the lower lying areas of the Southern Highlands, low intensity shifting cultivation targeting sago, banana, and mixed crops dominates land use (refer to **Figure 7**).^{[29]²⁹} Substantial areas across both provinces mainly along the border with Enga and Western Highlands Province are covered by exploration licenses for mining and extractives.

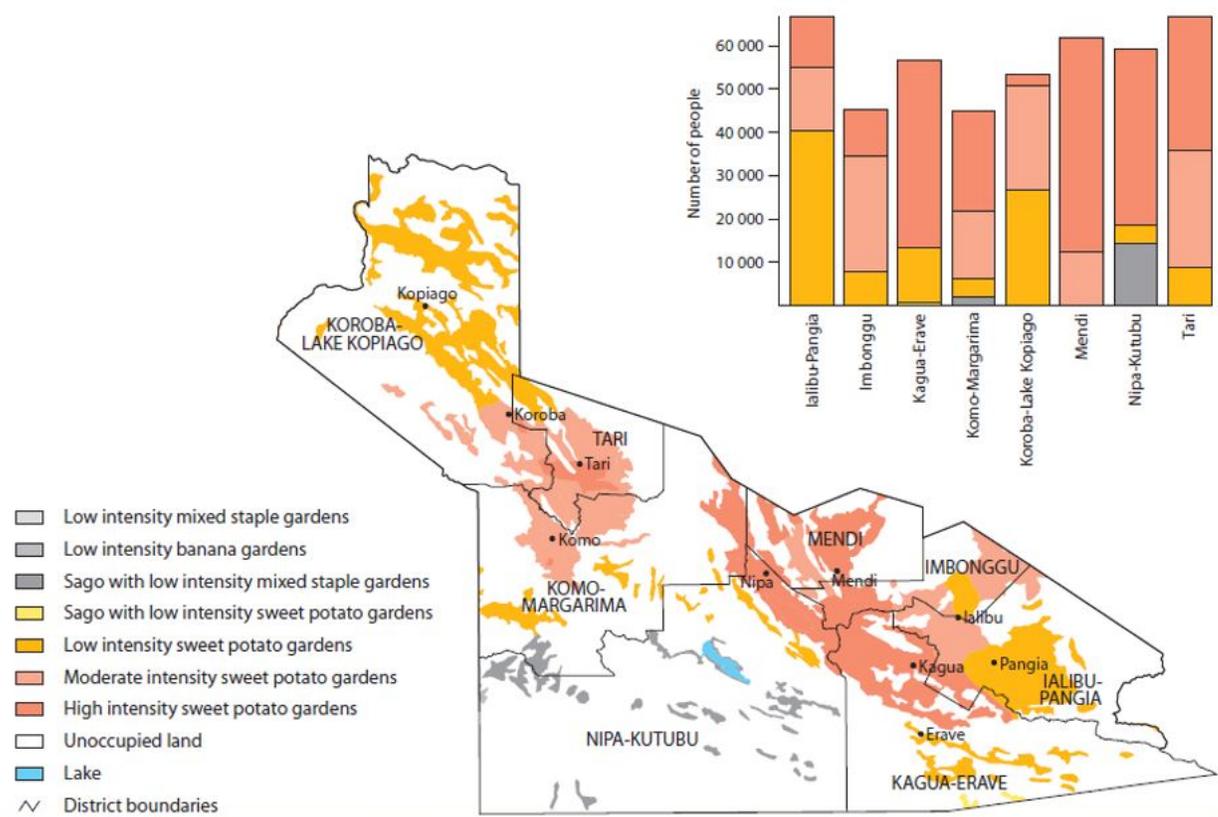


Figure 7: Agricultural systems in Hela and Southern Highlands Provinces (reproduced with permission from the PNG Rural Development Handbook^{[30]³⁰}).

Land degradation in the Highlands Region is more accelerated as compared to other regions of PNG, except for East & West Sepik. Between 2000 to 2014, 2,259,922 hectares of land were degraded in the Highlands, representing 15.5 percent of the total land that was degraded in PNG during the same

period, against a 13.5% share of the country's territory.[31]³¹ Remote sensing analysis tools applying Google Earth Engine, such as EarthMap (earthmap.org) developed by the Food and Agriculture Organisation (FAO), and the TrendsEarth extension to QGIS developed by Conservation International using GEF funding[32]³² allow for estimates of the status of land degradation in Hela and Southern Highlands Provinces. Land productivity expressed through the analysis of the Normalized Difference Vegetation Index (NDVI) in EarthMap shows mostly healthy vegetation, which ranges between 0.25 and 0.8 largely as a function of elevation above sea level. Areas of the highest population density (refer to **Figure 2**) show the highest NDVI values, which indicates that vegetation status is not heavily impacted by human population pressure. However, the land productivity index declined in densely populated areas, including the Tari Basin and to the west and southwest of Mount Giluwe, while it improved in areas of low population density (**Figure 8**). The Trends.Earth analysis corroborates these results (**Figure 2**).

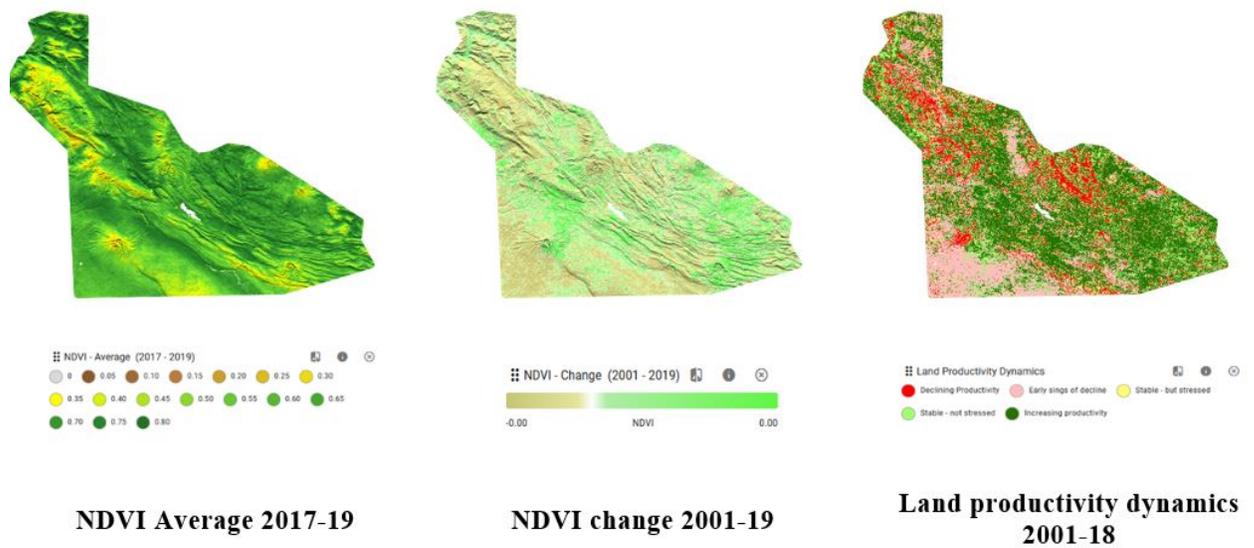


Figure 8: Land Degradation Neutrality (LDN) indicator trends (source Earthmap.org).

According to the analysis of deforestation by Global Forest Watch, between 2001 to 2020, Hela lost 19,000 ha of humid primary forest that is equivalent to 2.5% of the baseline. The loss of primary forest dominated total tree cover loss, which amounted to 27,300 ha. This was to a limited extent offset by tree cover gain of 2,320 ha in agricultural landscapes and degraded forest land. During the same period, Southern Highlands Province lost 17,400 ha of humid primary forest, equivalent to 1.3% of the baseline. The loss of primary forest dominated the total tree cover loss of 26,000 ha that to a limited extent was offset by 2,230 ha of tree cover gain during the same period. Tree cover loss was concentrated to areas of high population density, to the southwestern corner of Hela and the north-

western corner of Southern Highlands Province.[33]³³ No information could be accessed on forest degradation in the two provinces.

Social and land tenure context

1. PNG scores very low in all key composite indices that measure human development. For 2019, its Human Development Index value was 0.555 ? which puts the country in the low human development category ? positioning it at 155 out of 189 countries and territories, while its Gender Inequality Index value was 0.725, ranking it 161 out of the 162 countries for which this index was measured. The literacy rate in the Highlands Region remains low at 39.2%. The literacy rate in the Highlands Region remains low at 39.2%. Gender disparity in literacy rates in the Highlands is very high and in Chimbu Province illiteracy among women is almost double than among men.[34]³⁴

PNG has an indigenous population of mainly Melanesian ancestry and society is defined by kinship and extended tribal and family allegiance, in which land plays a central role. Of the population of 8.78 million, 85% are rural and several communities live in virtual isolation.[35]³⁵ PNG is a highly culturally diverse country with over ten thousand autonomous tribes with their unique social, cultural, and political attributes that speak over 800 different languages. The majority of the population is concentrated in the coastal regions, although dense populations are located in parts of the Highlands around the central plateau. The Southern Highlands Province has a total population of 509,488 of which 246,552 are females, whereas Hela Province has a total population of 248,838 of which 120,435 are females. Population concentrates in the Mendi and Tari Basins, the highways connecting these, as well as Mendi with Western Highlands Province, the upper reaches of the Kikori River, and surrounding Mount Giluwe (**Figure 1**). Hela Province is dominated by Huli speakers and related tribes, who trace back their ancestry to a common mythological ancestor. Strong ties as well as animosities define social interactions, and violence between clans is prevalent. While the potential for impact across sex groups is the same, women bear the brunt of clan warfare as homes and gardens are often destroyed. Men often go into hiding while women ? who are not directly targeted - have to protect children and may be harmed collaterally. The population of Southern Highlands Province is more heterogenous, with several ethnic groups and languages that include Imbongu, Kagua-Erave, Yalibu, Kutubu, Mendi, Munihi, etc.[36]³⁶ Though not in very high number, Internally Displaced Persons are present in the two Provinces. In total, 44,500 Internally Displaced Persons were registered across PNG in 2016, mainly as a result of tribal fights, land disputes and natural disasters.[37]³⁷

Under PNG's customary land tenure system, local people own and control up to 97% of the land through a clan system, including the resources on, under and above land ? this means that long-term habitat protection relies on the commitment and participation of the local communities, who depend on these ecosystems and their products for their livelihoods.

Economic context

PNG remains a low-income country with a dual economy comprising a small formal, corporate-based sector and a large non-formal sector where subsistence farming accounts for the bulk. PNG has one of the least diversified economies in the region, with a 24% GDP share of extractive industries and a 27.6% GDP share of agriculture. 55% of all export revenues are realized from minerals,[38]³⁸ and PNG is the largest exporter of tropical timber after Malaysia. Agriculture provides livelihoods to 85% of the population, whereas employment in extractive industries is limited.[39]³⁹ The formal sector provides a narrow employment base, consisting of workers engaged in the resource sectors (mining, logging, oil, and gas extraction, etc. generating 1% employment), a relatively small manufacturing sector, public sector employees and service industries including finance, construction, transport, and utilities. The relatively strong, though volatile, growth of the resource sector is not generating sufficient employment opportunities to reduce poverty. In rural areas, self-employment in agriculture is the primary economic activity, particularly for women.[40]⁴⁰ In contrast, only 24% of employees in the oil and gas sector are females and the figures in energy and mining sectors lie at 20-25%. Agriculture is mainly subsistence oriented and characterized by low productivity and limited cash income. Approximately 40% of the rural population in the Highlands live on land with very low to low land potential, constrained by some combination of poor soil, high rainfall, steep slopes, excessive cloud cover, frequent flooding, and low temperatures.

Though 30% of PNG's land is moderately to well suited for agriculture, less than 4% is used for commercial agriculture.[41]⁴¹ While both Hela and Southern Highlands Provinces are considered remote by PNG standards, this applies more strongly to Hela. Despite investments in road infrastructure, 20% of the two provinces' population live in places accessible only by air.[42]⁴² However, in areas served by good transport infrastructure, subsistence farmers are increasingly entering the cash economy through the sale of surplus produce, and by combining subsistence food production with cash cropping. In the targeted Provinces this is frequently achieved by growing cash crops with subsistence crops in agroforestry systems (e.g., banana that provides temporary shade for coffee or peanuts). Coffee is a very important cash crop produced to 97% in the Highlands, primarily on smallholder farms. Fresh food, such as sweet potato and vegetables are also important crops. Sweet potato assures food security in more diverse mountain environments where coffee, vegetables and small livestock provide cash income. Fresh food sale is important particularly for the lower coffee production areas of Southern Highlands, Hela and Enga provinces,[43]⁴³ and cocoa is also increasingly planted in the Highlands. The growth of agriculture is linked closely to the high rural population growth of 2.3-2.6%, but also reflects the needs of communities to develop increased cash crops in response to modern economic pressures. With almost all remaining forest areas in the hands of communities, clearance and conversion for planting subsistence and cash crops continue to be a strong underlying driver for the loss of biodiversity, with the added pressures from hunting in areas proximal to settlements, agriculture, or access routes.

More than 90% of private enterprises are micro-sized and informal, oriented towards agriculture production. Formalizing and commercializing engagement in agriculture can potentially provide broad-based income and employment opportunities across the region, including among women and young people. Formally registered firms account for less than 300,000 employees and contribute only 10% of the country's GDP. Women and youth who make up 70% of the population are particularly inactive in the formal economy, as only 8% of all the Small and Medium Enterprises (SMEs) in PNG are owned by women. The number of SMEs vary among the provinces in the Highlands region: In 2004, 16% of the SMEs were registered in the Southern Highlands province, whereas Hela province did not have a single registered SME.[44]⁴⁴ Limited incentives are available to SMEs to stimulate participation in the formal economy and growth. Access to financial services is a key constraint for the private sector and 94% of registered SMEs have never obtained any form of loan. 85.6% of PNG's population have no access to banking services and this figure stands at 91.9% in the Highland Region.[45]⁴⁵ Limitations in accessing land, credit, skilled workers, and a predictable and consistent policy environment limit the potential to formalize and develop land-based businesses in the PNG Highlands.[46]⁴⁶

Large commercial activities in Hela and Southern Highlands Provinces are practically inexistent, apart from the LNG Project operated by ExxonMobil PNG Limited, which alone accounts for about 10% of the national GDP and over 30% of exports. The LNG Project covers about half of the area of Hela and Southern Highlands Provinces and is located within the Kikori river basin, traversing several areas of high biodiversity significance (**Figure 9**). In Hela Province and LNG upstream area overlaps with the Project areas. In its commitment to safeguarding the biodiversity values, ExxonMobil PNG has developed a Biodiversity Strategy.[47]⁴⁷

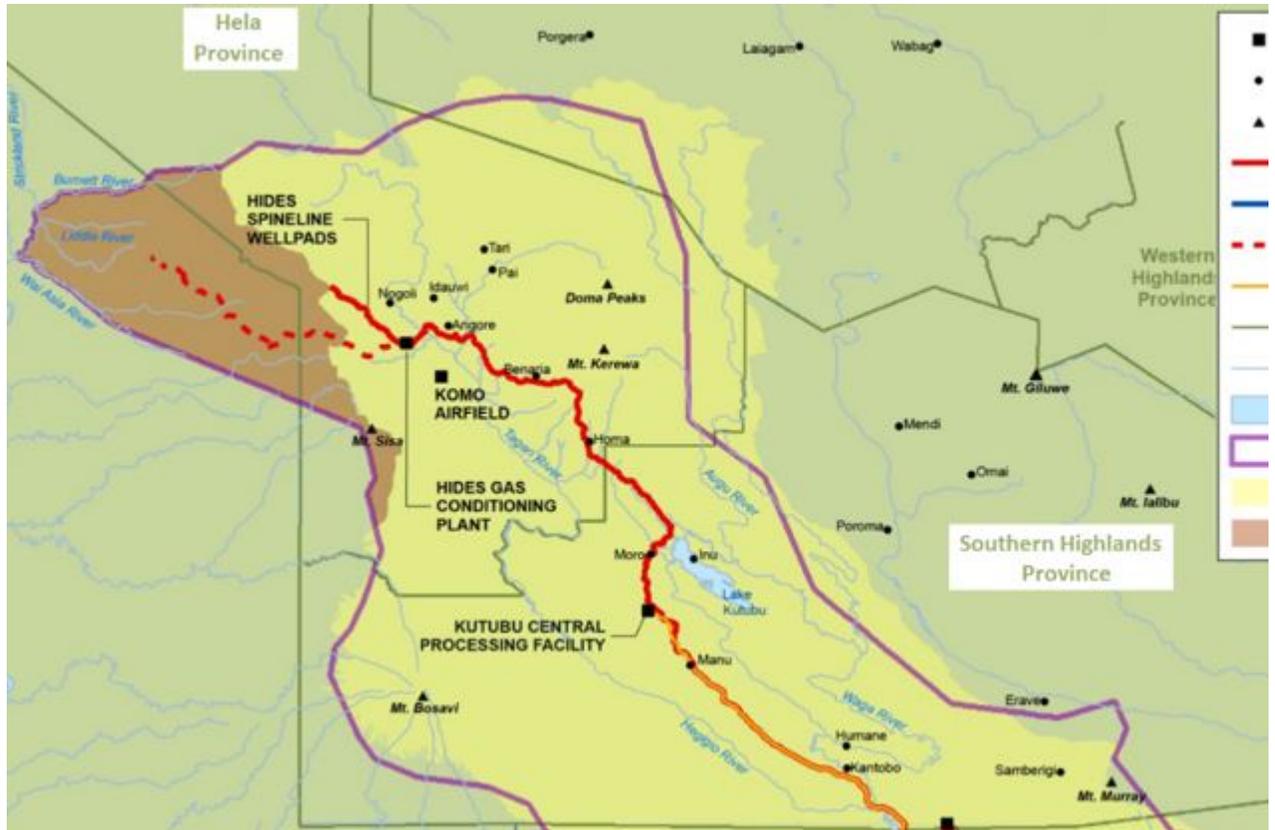


Figure 9: PNG LNG project area located within Hela and Southern Highlands Provinces[48]⁴⁸

Institutional framework

PNG is defined by a high level of decentralization, including increased financial devolution to Provincial, District and Local Level Governments. At the national level there are presently 33 ministries and over 140 government departments and agencies that are partially represented at provincial and district levels. Capacities at provincial and district levels vary substantially.[49]⁴⁹

The institutional framework of the baseline scenario is dominated by government departments and government authorities. The Conservation and Environment Protection Authority (CEPA) was established in 2014 as an autonomous self-funded organization to oversee environmental conservation in PNG as well as to regulate development activities as governed by the Environment Act 2000 and its associated regulations. The CEPA aims ?to ensure natural and physical resources are managed to sustain environmental quality and human well-being?. CEPA is also the authority with a legal mandate to implement the CBD, UNCCD and related conventions in PNG and is responsible for LDN target setting. Several Divisions exist within CEPA, of which the Project is executed by the Policy Division, overseen by the Senior Policy Officer. The CEPA is responsible for maintaining environmental safeguards in PNG as mandated under the Environment Act 2000 and its accompanying regulatory instruments including the Environment (Prescribed Activities) Regulation 2002, and three guidelines issued in 2004 for assessing environmental risks.

Together with the Department of Agriculture and Livestock (DAL), the Department of Lands and Physical Planning (DLPP), the Department of National Planning and Monitoring (DNPM), the Climate Change and Development Authority (CCDA), the PNG Forest Authority (PNGFA), the Department of Provincial and Local Level Government (DPLLG), and the respective provincial and local level governments, CEPA has been working on integrating environmental plans and protected areas in land use planning and zoning, the issuance of exploration licenses, Forest Management Areas and Logging Plans. The government organogram in **Figure 10** presents government departments that are stakeholders of the Project.

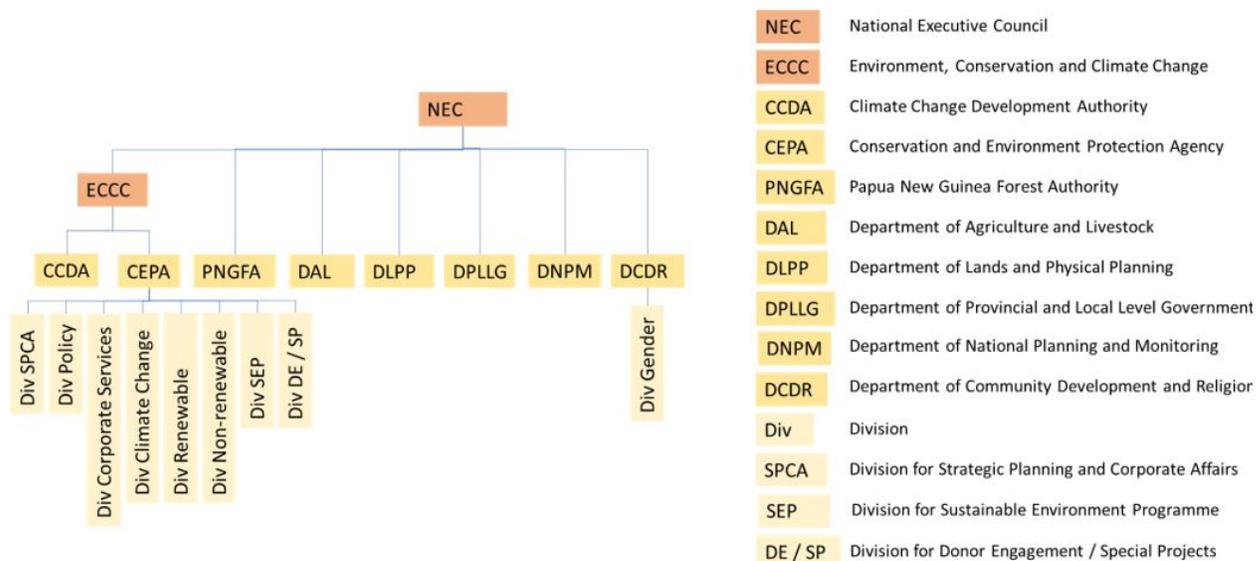


Figure 10: Baseline scenario government organogram.

The Department of Agriculture and Livestock (DAL) is mandated to oversee the agriculture and livestock sectors of PNG. In the past, DAL employed a network of agriculture extension officers in most provinces, who provided hands-on agricultural extension services to farmers for growing food and cash crops. The DAL owns the National Food Security Policy 2016-26 and is the custodian of two important national databases, the Mapping Agricultural Systems in PNG, and the Papua New Guinea Resource Information System.

The Department of Lands and Physical Planning (DLPP) oversees all land matters including spatial planning in PNG. As mandated by the Land Act 1996, its mandate focusses on the ownership, allocation, and release of state and customary land for development purposes. Other relevant legislation and policies guiding the activities of the DLPP are i) Land Registration (Amendment) Act 2009, ii) Incorporation Land Group (Amendment) Act 2009, iii) Physical Planning Act 1989, and iv) Draft National Sustainable Land Use Policy 2018. The DLPP has officers in the provinces and takes active part in the development agenda of the country. However, officers lack capacities in the identification of biodiversity rich areas.

The Department of National Planning and Monitoring (DNPM) leads, plans, coordinates and facilitates equitable and sustainable development of PNG, in accordance with the country's long term strategic planning documents (refer below). The DNPM advises the government on strategic development, development policy, development planning and programming, foreign aid coordination and management, and monitoring and evaluation of national development projects and programmes. The DNPM will ensure that the Project is well embedded into overall development planning and relevant policies.

The Climate Change and Development Authority (CCDA) has been recently upgraded to the level of an authority and implements programmes on adaptation, mitigation, and Measurement, Reporting and Verification (MRV) and is a key stakeholder of REDD+ along with PNGFA, DAL, and CEPA. The CCDA owns the Climate Compatible Development Management Policy 2013-2015. The CCDA has data gaps for the next NDC reporting in 2025 and the Project may help to fill gaps.

The PNG Forestry Authority (PNGFA) is mandated with sustainable management of PNG's forests, mostly following a 20-year logging cycle. The PNGFA is the custodian of the Forestry Act and the country's REDD+ programme. PNGFA implements the National REDD+ Strategy 2017 ? 2027 and is also the custodian of the Forest Information Monitoring System.

The Department of Provincial and Local Level Government (DPLLG) administers the government budget handed down from the national to the provincial, district and local level governments. Budget is frequently released directly from the national to the district levels, bypassing the provincial level, which prevents proper coordination and planning of development activities at this level. Most of the DPLLG's activities are not attributed to land, however it has a principal role where customary land needs to be alienated to state land for development purposes. Under the sections of the Organic Law on Provincial Governments & LLGs 1998, a Certificate of Alienation will need to be issued by DPLLG after a Land Investigation Report has been completed by DLPP. No land will be alienated through the Project, however the DPLLG needs to be part of shaping the land use planning process. Besides, the DPLLG is an important partner in ensuring the linkage between national government policies and implementation on the ground in provinces, districts, local level government areas and wards.

The Department for Community Development and Religion (DCDR) primarily develops policies and legislation that are translated into programs to promote and protect the rights of marginalized and vulnerable groups such as children, women, persons living with disability and the elderly. At the same time, the Department provides institutional strengthening through partnerships and mobilization of resources.

Policy, legal and regulatory framework

The Constitution of the Independent State of PNG 1975 mandates the conservation of environment and adherence to environmental sustainability. Furthermore, it codifies traditional law and defines the framework of a three-tiered system of government, which includes the national, provincial, and local levels. Additionally, it relegates the preparation of legislation on agriculture, forestry, land and land development, agroforestry, and renewable natural resources to the provincial level. PNG is divided into 22 provinces, which are consecutively subdivided into districts, local-level government areas, and ultimately into wards.

PNG is a party to all three Rio Conventions. PNG ratified the CBD in 1993, has accessed the Cartagena Protocol in 2006 but is not a party to the Nagoya Protocol on Access and Benefit Sharing. The country has submitted its second National Biodiversity Strategy and Action Plan in 2019 and its Fifth National Report to the CBD in 2017. PNG ratified the UNCCD in 2000, has prepared a National Action Plan, and has submitted its national LDN targets in 2019. Under UNFCCC, PNG is a Non-Annex I Country that ratified the Kyoto Protocol in 2002 and the Paris Agreement in 2016. PNG has submitted two NDCs but has not prepared a National Adaptation Plan. Under REDD+, PNG has submitted the REDD+ Strategy, the Safeguards Information, and the Forest Reference Levels.

Papua New Guinea has ratified the Convention on the Elimination of all kinds of Discrimination Against Women (CEDAW) but has not yet submitted any national reports. The CEDAW has prepared one Country Report on PNG in 2010.

In 2010 PNG defined its overarching development strategy Vision 2050, which defines a strategic path to achieve the aspirations of the National Constitution 1975. The Vision 2050 defines Environmental Sustainability and Climate Change as its fifth of seven pillars. Similarly, the PNG Development Strategic Plan 2010-2030 also contains Environment and Climate Change as its sixth objective. Both identify that environmental health and addressing climate change are strategic national priorities.

The National Strategy for Responsible Sustainable Development 2014 (StaRS) bridges the transition between the above-stated long-term national development strategies and subsequent shorter-term

development plans. The StaRS contains guidelines to ensure that these shorter-term plans that are frequently politically driven are screened through the lens on long-term sustainability. The StaRS emphasizes inclusive green growth as well as reducing poverty, wellbeing, livelihoods and social protection and access to essential services while retaining and protects biodiversity and ecosystems and services. Terrestrial ecosystems are essential for LDN and hence this strategy is of immense importance for the Project. The objectives of StaRS are achieved through the Green Growth Framework with three dimensions and several subcomponents each. The first dimension (Green Growth Plan) contains amongst others the shift of government expenditure and the enforcement of legislation as enabling conditions. The second dimension (Green Growth Mainstreaming) lists public environmental expenditure review, SEAs, and green accounting as mainstreaming mechanisms. The third dimension (Green Growth Policy Instruments) lists payment for ecosystem services and environmental fiscal reforms as policy instruments.[50]⁵⁰

PNG's Medium Term Development Plan III 2018-2022 (2018) defines government strategy over an on-going period of five years, and it establishes a goal to 'promote environmental sustainability?'. However, the Plan does not define any environmental priorities for the renewable, mining, and petroleum sectors. The Plan contains an Environment Logframe, which prioritizes strategies to i) improve biodiversity conservation for the purposes of tourism and also for protecting and maintaining PNG's diverse flora and fauna; ii) enforce the implementation of principles prescribed by StaRS to protect the environment by shifting to polluters to internalize environmental cost through setting standards for penalties and fees; and to iii) improve compliance of industry and municipalities with waste management regulations;

The PNG National Action Plan for the UNCCD (NAP) 2020 focuses on halting and reverting land degradation through three focal sectors, agriculture, forestry, and mining, on mainstreaming SLM into the policy, legal and regulatory framework, and on capacity development.

The PNG National Biodiversity Strategy and Action Plan (NBSAP) 2017-2027 provides the roadmap to the sustainable management and conservation of the country's biological resources. The NBSAP is structured around three goals and several national targets, which include: i) knowledge on biodiversity; ii) biodiversity mainstreaming into national development plans & strategies; iii) capacities to limit illegal and unsustainable practices in agriculture, iv) fisheries; v) sustainable use and protection of biodiversity; vi) reduced habitat loss, degradation and fragmentation; vii) sustainable forest management; viii) pollution and waste management; ix) invasive alien species; x) agricultural biodiversity; xi) biodiversity and sustainable fisheries; xii) vulnerable ecosystems; xiii) Protected Areas; xiv) preventing extinctions; xv) climate mitigation and adaptation measures; and xvi) community empowerment.

The PNG National REDD+ Strategy 2017-2027 includes action areas on strengthening national land use and development planning, environmental management, protection and enforcement, and financing investments for REDD+ including through results-based payments. The land use planning approach under the REDD+ strategy foresees large, forested areas and the introduction of carbon forestry projects to support conservation and sustainable use of forests and thereby the achievement of LDN.

Forestry and Climate Change Framework for Action 2009 ? 2015 discussed the harvesting and replanting of degraded forest area while also considering REDD and REDD+ projects. A newer framework in planning since 2016 onwards has not yet been prepared.

The National Agriculture Development Plan (NADP) 2007-2016 aimed to develop the agriculture sector by reducing costs of production, increasing agriculture-based income generation opportunities, targeted allocation of resources to priority areas, and mainstreaming of gender equality in agriculture. The priorities of the outdated NADP include agricultural research, food, and agricultural crops development; tree and industrial crops development; gender and social issues; regulatory and technical services; and coordination.

The PNG Policy on Protected Areas 2014 establishes the principles for protected area management, and prioritizes local community participation, including through Community Conserved Areas.

The draft policy framework for PNG National Biodiversity Offsets Policy 2020 defines the requirements for a policy and associated regulations to compensate for industrial projects' environmental impacts in PNG. The policy framework foresees the calculation of biodiversity offsets for EIA level 2 and 3 projects based on an offset calculator, which defines the financial liabilities to be transferred into a Trust Fund. Funds are to be used to establishing new and managing existing protected areas.[51]⁵¹

The draft National Sustainable Land Use Policy 2018[52]⁵² is the latest policy by DLPP which provides a very strong mandate for land use planning from the land degradation, biodiversity conservation and climate change perspectives. The NSLUP takes a holistic approach to planning to enable sustainable land management, balancing the promotion of development with conservation and sustainable rural development. The National Land Development Program's main perspective of land reform is for releasing land for development and poverty reduction, whilst also to protect the rights of vulnerable sections of society. The policy calls for the assessment of the physical, socio-economic, institutional, and legal potentials and constraints with respect to an optimal and sustainable use of land resources and empowers people to take decisions on land allocation for various purposes under consideration of the provisions of the Physical Planning Act 1989 and the Environment Act 2000. If this policy gets implemented by DLPP, it will have some ramification across government agencies, including the PNGFA and the Mineral Resource Authority (MRA). These two agencies have mapped out areas with timber and mineral resources and hence dialogue will need to be encouraged amongst them on the application of this policy to already designated areas.

The lapsed Climate Compatible Development Management Policy 2013-2015 focused on a low carbon growth pathway and green economic growth to ensure environmental resilience and to provide for a robust and sustainable economy, underpinned by conscious planning and allocation of land and natural resources.

The National Food Security Policy 2016 - 2026 provides a framework for agriculture considering natural disasters, including climate change for a 10-year period which fits well into the timeframe for the SDG (2015- 2030) and LDN. This policy will consider climate smart farming techniques and be inclusive of all genders and the private sector. In addition, the Agriculture Smart Policy is under preparation to take care of the challenges in developing agriculture for Papua New Guinea. Its outcome will have an impact on food security in Papua New Guinea, including the provinces targeted by the Project.

The National Policy for Gender Equality and Women's Empowerment 2011 ? 2015 identifies gender-based violence, women's health, HIV/AIDS, education and training, cultural norms and traditions, women's economic empowerment, employment opportunities and conditions, equality in decision-making, agriculture, and environment as priority action areas to advance gender equality.

The Gender Equality and Social Inclusion (GESI) Policy 2013 promotes the principles of inclusion and equity in the public sector. The policy translates provisions of the National Policy for Gender Equality and Women's Empowerment 2011-2015 into practical recommendations for the public sector. These include provisions to enhance gender equality, amendments to the legal framework to ensure equality and inclusion in public workplaces and provides guidance for relevant action within organizations.

Legislation related to biodiversity conservation includes the Environment Act 2000 and the Environment Act 2000, Amended that spell out the mandate for the wise use of environmental resources, development recognizing environmental limits of sustainability, and ensuring the provision of ecosystem services as key priorities. In addition, the Act emphasizes on carefully weighing social, environmental, and economic priorities. It also calls for regulating activities the damage the environment and for mitigating environmental impacts. The Act specifies with significant detail EIA

procedures and offences, as well as monitoring and enforcement of the provisions of the Act. EIA is categorized into levels 1, 2, and 3 based on consequently increasing gravity of the expected impact. The stipulated EIA procedure requires the submission of an inception report, ii) Environmental Impact Statement (EIS), iii) assessment and public review of the EIS, iv) Director's acceptance of EIS, v) referral to the Council, vi) recommendation to the Minister, vii) approval by the same. Only once an Environmental Permit is issued at the end of the process, can the development activity proceed.

Legislation related to land management includes the Lands Act 1996, which defines a comprehensive framework for land ownership, defining various ownership and use titles and categories. The Act also establishes a Lands Board to review lease applications. The Land Groups Incorporation Act 1974 provides the legal framework for the formal, group-based involvement of local people in land-based economic activities. The Incorporated Land Group (Amendment) Act 2009 is an amendment to a previous legislation and allows for the landowners to be properly represented in projects so that benefits owing to them would go into a designated account for all to access. However, certain issues regarding the process of administrating this Act remain to be resolved. The Land (Ownership of Freeholds) Act 1976 regulates the ownership title of 'freehold'. The Land Registration Act 1981 specifies the format of registering land titles. The Land Registration (Amendment) Act 2009 allows for land to be registered and ensures that land is documented properly so that it is for its intended purpose. The Land (Tenure Conversion) Act 1963 outlines options for the personal registration of customary land. The National Land Registration Act 1977 establishes a national land register and establishes the National Land Commission. The Physical Planning Act 1989 allows for the development, management and the best use of land and land resources from both within and outside the sphere of the planning process. Unimproved land could also be an avenue for sustainable development if appropriate land use is in place. The Special Agriculture Business Lease (SABL) is controversial, and a Commission of Inquiry was instituted which examined aspects of granting SABL for logging and agriculture on customary land without the landowners' consent.^[53] DAL and PNGFA are involved in the deliberation of the SABLs and DAL has identified a number of issues with the lease.

The Conservation Areas Act 1978 ensures the preservation of the environment and of national heritage, establishes the National Conservation Council and regulates the establishment of Protected Areas. The Conservation and Environment Protection Authority Act 2014 established the CEPA and provides for the conservation of the environment. The Fauna (Protection and Control) Act 1966 regulates the protection, control, harvesting, and destruction of fauna, and the declaration of protected species. The International Trade (Fauna and Flora) Act 1979 ensures the national implementation of CITES, including through a schedule of flora and fauna categories.

The Forestry Act 1991 mandates the sustainable management of PNG's forests, including through a National Forest Plan, defined at the national and provincial levels, that specifies how forests are managed. Forests on customary land may only be managed by registered forest industries through a Forest Management Agreement (FMA), Timber Rights Purchase Agreement, timber authority, or clearing authority. The Act also specifies the procedures of tendering a Forest Development Project (FDP), which is the permit for utilization. Furthermore, the Act also specifies permits and offences, as well as the duties of registered forest industries.

The Mineral Resources Authority Act 2005 establishes the Mining Resources Authority for overseeing mining activities in the country. The Mining Act 1992 regulates mining, including the procedure of mining leases and other permitting. The Mining Development Act 1955 deals with the financing of mining activities. The Oil and Gas Act 1998 regulates the exploration of petroleum and the transfer of financial benefits to local communities and local and provincial governments. It also puts in place a limited set of environmental safeguard measures.

The Climate Change (Management) Act 2015 regulates climate-responsive development through mitigation and adaptation, establishes the Climate Change and Development Authority, and sets the framework for implementing PNG's UNFCCC commitments. The United Nations Paris Agreement (Implementation) Act 2016 regulates the implementation of PNG's Paris Agreement commitments.

The national regulatory framework includes regulations that specify the Environment Act 2000, mainly include the Environment (Prescribed Activities) Regulations 2002, which defines three levels of environmental risk and national importance rising from Level 1 to 3. Activities that will cause environmental harm are defined in the Environment Act 2000 as prescribed activities and are listed as a series of activities within the Schedule. All prescribed activities require an Environmental Permit to be issued by CEPA before the development can begin. Non-prescribed activities do not require an Environmental Permit to operate but are required to operate in accordance with the Act. Further regulations specifying the Environment Act 2000 include the Environment (Permits) Regulation 2002; and the Environment (Fees and Charges) Regulation 2002; the Environment (Council's Procedure) Regulation 2000; and the Environment (Water Quality Criteria) Regulation 2002; and the Operational Procedures for Environment Act 2000.

The Lands Act 1996 is further specified in the Land Regulation 1999, whereas the Land Registration Act is specified by the Land Registration Regulation 1999. The Land (Tenure Conversion) Act 1963 is spelt out in the Land (Tenure Conversion) Regulations 1964.

The Mining Regulations 1992 specify the Mining Act 1992. The Mining Development Regulation 1957 supports the Mining Development Act 1955. The Oil and Gas Regulation 1999 and the Oil and Gas Regulation 2000 provides for subsidiary legislation under the Oil and Gas Act 1998. The Fauna (Protection and Control) Act 1966 is further specified in the Fauna (Protection and Control) Regulation 1968 as well as a range of regulations specific to individual protected areas. The International Trade (Fauna and Flora) Act 1979 is further specified in the International Trade (Fauna and Flora) Regulations 1982.

Landscapes of Intervention

20. The Project's area-based interventions cluster around three categories: i) implementation of SLM technologies on degraded agricultural land, ii) community-based forest management of degraded forests, and iii) agroforestry on degraded agricultural land or heavily degraded forest land, which contribute towards GEF Core Indicators 3.1, 4.1. and 4.3, respectively. The map of Hela and Southern Highlands Provinces showing the location of these sites is presented in Annex E. A detailed description of each site is provided in the subsequent sections.

Landscapes in Hela Province

Dauli valley is in the Tari Plains and bound by Tigibi and Hulia rivers that originate from Mt Ambua and cross the Tari basin, flowing east to west and forming wetlands before they empty into the Tagari River. Most of the valley is above 1500m altitude and the valley bottom has been largely utilized for active and fallowed shifting cultivation or is occupied by wetlands. Forests disturbed by pigs and scattered logging cover most of the steeper slopes and ridges. At lower altitudes they are dominated by *Castanopsis*, *Lithocarpus*, *Conandrium*, *Sloanea* and *Symplocos* spp. At higher altitudes around the northern parts of the basin, forests have a more mixed composition with *Astronia*, *Cryptocarya*, *Elaeocarpus*, *Beilschmiedia*, and *Planchonella* spp. Dominant, whereas *Nothofagus* spp. covers rugged limestone ridges. Birds include dwarf cassowary (*Casuarius benneti* - LC), Brown Sicklebill (*Epimachus meyeri* - LC), the Black Sicklebill (*Epimachus fastosus* - LC), the King of Saxony Bird-of-paradise (*Pteridophora alberti* - LC) and Ribbon-tailed Astrapias (*Astrapia mayeri* - NT). Notable mammals include different species of echidnas, ground cuscus and tree kangaroos. Both birds and mammals are heavily hunted. The presence of invasives is less serious than in Tari Basin and is concentrated around giant cane (*Arundo donax*) that is present along the roads. Land in the valley bottom is in advanced stages of degradation, dominated by grasses, but forest degradation is less severe. Small areas of relatively mature forest occur on the basin floor near areas of high population that have been preserved for ritual purposes. The soil is fertile and has supported intensive cultivation of sweet potato following continuous cropping. Huli gardens consist of tall, composted mounds where crops are cultivated for decades before the mounds are allowed to fallow. However, due to high altitude and lower temperatures, garden productivity is generally low, compared to other highlands provinces. Tribal conflict is not prevalent and the heavily populated near Tari town provides an opportunity for involvement of educational institutions and marketing opportunities. Both, SLM and agroforestry activities will be implemented here.

Hoeibia valley is also located in the Tari basin, east of Tari town. Though Hoeibia and Dauli are two different communities in two different Districts and LLGs, the general descriptions provided for Dauli above apply to both sites. Hoeibia is heavily populated and land use is dominated by intense cultivation of sweet potato. There is an active female LLG member who has mobilized women into marketing agricultural produce, including bulb onions, broccoli, cauliflower, and potatoes, which presents opportunities of SLM but also SFM (agroforestry) in the area.

Koroba valley is in a remote location northwest of Tari Basin at an altitude range from 1700 -2200 m asl. The valley is bound by the Pori and the Tagari Rivers creating large expanse of swamp forests and bogs on the valley floor. The valley side is steep in the east and rolling hills to the west, providing suitable environment for subsistence agriculture. In general, the area is heavily forested except for locations within proximity to settled areas which are intensely cultivated. There are flat raised areas which are heavily cultivated as well. The forests are characterized as mixed montane, dominated by conifers. The hilly forest communities are floristically rich with trees such as *Carpodetus*, *Myrtaceae*, *Glochidion*, *Homolanthus*, *Maesa*, *Pandanus* and locally *Nothofagus* spp. forming a variable canopy. Conifers such as *Dacrydium* and *Podocarpus* spp. are also common. Beneath the canopy a dense layer of small trees and shrubs is found. The valley floor remains relatively open with irregular hummocks separated by water pools. The swamp forests are also dominated by conifers. The fauna is largely identical to that of Dauli. Common invasive species include giant cane (*Arundo donax*), *Cenchrus purpureus*, *Piper aduncum*, and *Tithonia diversifolia*. Land degradation is evident in the form of large expanses of anthropogenic grassland in the valley bottom. Land use in the Koroba valley is dominated by intensive sweet potato cultivation that is continuously cultivated on high composted mounds. The soil is fertile from the layers of volcanic ashes originating from historic volcanic eruptions in the region. There are now trials underway to grow rice, utilizing swamp in the valley. Other cash income opportunity being trialled is honey production. These and the existing Women in Agriculture organization provide opportunities for SLM interventions. In addition, community forestry will focus on existing remnant and intact forests to be managed through the legal framework of Conservation Deeds and community forest management plans. In addition, both *Castanopsis* spp., *Nothofagus* spp. and *Paraserianthes facultaria* will be planted on slopes, whereas in swampy areas, *P. facultaria* and *Ficus* spp. will be most suitable.

Magarima is a relatively flat high-altitude wide valley located between Wage River in the east and Tari Gap/Doma-Ambua range to the west. The valley consists of rolling hills and wide grassy valley floor. Remnant forests can be found in the foothills; however, most forests are lower montane and can be found on the higher mountain slopes. The canopy is dominated by *Castanopsis acuminatissima*, *Lithocarpus* sp. and *Nothofagus* sp. with the former in lower and the latter in the higher altitudes. Understory species include *Garcinia*, *Astronia*, *Polyosma*, *Symplocos*, *Sericolea*, *Drimys*, *Prunus*, *Pittosporum* spp., and members of the Araliaceae family. Cleared land is dominated by grasses, including *Eulalia leptostachys*, *Ischaemum* spp., *Arthraxon ciliaris*, and *Imperata* sp. The soil is fertile from the layers of volcanic ash originating from historic volcanic eruptions in the region. With rich fertile soils, there are multiple plantings of crops before the land is left for a long fallow. Land use is dominated by intensive sweet potato cultivation, whereas intensive potato (*Solanum tuberosum*) cultivation is a recent activity to service the Kuk Potato factory. The Magarima valley is selected to implement SLM and SFM interventions.

Landscapes in Southern Highlands Province

Ialibu valley consists of alluvial fans and plains on the edge of Mount Ialibu and Mount Giluwe. A number of creeks and rivers originate from both Mt Giluwe in the north and Mt Ialibu to the east and flow through the valley. Altitude varies from 400 m at the junction of the Tua and Iaro rivers, to over 3,700 m on Mt Ialibu. The soil is fertile from the layers of volcanic ashes originating from historic volcanic eruptions in the region. Most people live between 1200 and 2400 metres. The forests are classified as lower montane, often covered by low clouds. The canopy plant species in the lower montane forests are dominated by *Castanopsis acuminatissima* (LC), *Lithocarpus* sp. in lower altitudes and *Nothofagus* sp. in higher altitudes. Understory species include *Garcinia*, *Astronia*, *Polyosma*, *Symplocos*, *Sericolea*, *Drimys*, *Prunus*, *Pittosporum* spp., and members of Araliaceae family. Forests show rich bird and mammal diversity, including *C. bennettii*, birds of paradise, and tree kangaroos. Remnant forests can be found in the foothills, however most of the forests can be found in higher

altitudes. Canopy trees were often logged to process timber for construction and for firewood. Land degradation is evident in large areas in the foothills cleared for subsistence cultivation and for settlements, where the dominant land cover is grass and the invasive giant cane (*Arundo donax*), but *C. purpureus* is also widespread. Subsistence agriculture is dominated by high intensity sweet potato cultivation. People make two to four plantings before leaving the land to fallow for one to four years. With rich fertile soils, there are three to five cultivation cycles before the land is left for a long fallow. The newly established University of Western Pacific is in the area, and it gears into full operation, food demand will increase, leading to land use change in the immediate area. Ialibu Women in Agriculture involving approximately 10,000 women have been trialling bulb onion and potato cultivation. Ialibu Station has a potato chip factory and several other initiatives including potato seed production and literacy programs make this valley an attractive area for implementing SLM and SFM investments.

Mount Giluwe is a shield volcano capped by the largest contiguous expanse of alpine vegetation in PNG. This is a globally significant montane and alpine wilderness (see above) threatened by logging of the beech-podocarp forests of its middle and upper slopes and subsistence agriculture and expanding settlements on the lower slopes. On the western slopes of Mt. Giluwe subalpine grasslands consisting of *Danthonia archboldii*, *Deschampsia klossi*, *Agrostis reinwardtii*, *Danthonia* sp., *Dichelachne novoguineensis*, *Deyeuxia* spp., *Anthoxanthum angustum*, and *Arundinella jurva* and subalpine conifer forests of the genera *Podocarpus*, *Dacrycarpus*, *Papuacedrus*, *Phyllocladus* and *Araucaria* dominate. Montane *Nothofagus* sp. forests occur at altitudes ranging from 1800m to 2700 m. The composition of birds and mammals are as described under Dauli valley and no noteworthy occurrences of invasives can be observed. Anthropogenic grasslands occur on degraded lower slopes and the beech-podocarp forests remain threatened by small-scale logging. Towards the southwest, land has been cleared for subsistence cultivation, dominated by sweet potato, particularly at lower elevations. A community-run trout farm operates in the area. The Project will implement agroforestry and community forestry interventions on the western slope of Mount Giluwe. Existing remnant and intact forests will be managed through the legal framework of Conservation Deeds and community forest management plans will be prepared. In addition, community forestry activities in these areas will involve plantations of *Nothofagus*, *Castanopsis*, and *Podocarpus* spp. In addition, the multi-purpose species *Casuarina oligodon* and *Paraserianthes* sp. will be promoted.

Pundia valley is a high-altitude narrow valley located immediately south of Mt Giluwe and locked in by a mountain range, both running parallel to the Anguale River in the south. Flora and fauna and the status of invasives are broadly identical to that on Mount Giluwe described above. Primary forest is found in the higher mountain slopes. Hillslopes are forested with secondary regrowth while most of the valley floor is grassland, agricultural land and settlements located on raised ground in the valley. Cultivation is dominated by intensive sweet potato cultivation. The soils in the valley are poor and need a lot of tillage, mounding and composting to get sufficient produce. While fertility is low, there are one to three cultivation cycles before fallowing. The produce in the valley floor is often poor. The Yarra Delta Fish Farm raising tilapia is one of the largest employers in the area. The proximity of the Western Pacific University and to Mt Hagen markets provide an opportunity for marketing fish. Tribal conflicts are not prevalent. All three categories of activities (SLM, agroforestry and community forestry) will be implemented in the area.

Baseline projects

Several government and donor-funded initiatives define the baseline in addition to the policy, legal, regulatory, and institutional framework. Relevant baseline projects on LDN; integrated landscape management; SFM; biodiversity conservation; environmental monitoring, assessment (EIA, SEA, NCA), and offsetting; and agricultural development that inform the Project's Theory of Change include:

LDN

? The government pursues mainstreaming LDN and land use planning into national policies and mandates at different levels. CEPA mainstreamed land degradation activities in its Protected Area Policy while the National Disaster Office and the National Weather Service have mainstreamed land

degradation into their drought contingency plans and early warning systems. The Department of Agriculture and Livestock and the National Agriculture Research Institute have policies, strategies and initiatives that address desertification, land degradation and drought within their respective mandates.

? Through the UNCCD LDN Voluntary Target Setting Programme, PNG identified a total of 7.73 million hectares to be restored while enhancing livelihoods and the country's biodiversity values. To achieve this ambitious target, identified measures included restoring degraded forest and agricultural lands, implementing sustainable land and forest management, creating an enabling environment through regulations, incentives, and partnerships, raising awareness of LDN, and developing capacity. LDN is being mainstreamed into ongoing activities focusing on agro-tourism, integrated pest management, Protected Area network, mining, and biodiversity offsets, and the establishment of wildlife corridors in agricultural landscapes. PNG is currently in the process of moving from incremental changes to transformations at scale to achieve its national LDN targets. Specific targets relevant in the context of the Project include i) SLM on 200,000 ha to be achieved in the Highlands and coastal areas, and ii) 100,000 ha to be rehabilitated in the Gulf, Central, Hela, and Southern Highlands Provinces.[54]⁵⁴

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Integrated landscape management

? The GEF 7 Enabling sustainable production landscapes in Eastern Highlands and Western Highlands Provinces for Biodiversity, Human Livelihoods and Well-being? Project (GEF ID 10151; GEF grant US\$ 6,463,097; cofinancing US\$ 52,650,000) is prepared in parallel with the Project with the closely related objective to mainstream biodiversity in priority sectors and landscapes in Eastern and Western Highlands Provinces. The project focuses on i) improving spatial data and strengthening integrated land use planning, coordination, and management, ii) scaling up landscape-level action for integrated conservation & sustainable supply chain development, iii) strengthening the enabling environment and governance structures for integrated landscape/land use planning, coordination, and management, and iv) effective knowledge management, monitoring and evaluation.

? The GEF 7 Establishing System for Sustainable Integrated Land-use Planning Across New Britain Island in Papua New Guinea? (GEF ID 10239; GEF grant: USD 10,709,174; technically cleared) under the Food Systems, Land Use and Restoration Impact Program and focus on New Britain Island of PNG. The project is in final stages of GEF review at the time of ProDoc preparation. The project aims to reduce rates of agricultural driven deforestation and biodiversity loss and to establish a sustainable system of land-use planning to guide future land development activities, sustainable and resilient commodity/crop production and farming systems across New Britain Island.

? R2R Strengthening the Management Effectiveness of the National System of Protected Areas? (GEF ID 5510; GEF grant: USD 10,929,358; under implementation 2015-2020). This project aimed to strengthen national and local capacities to effectively manage the national system of protected areas, and address threats to biodiversity and ecosystem functions in these areas. Its interventions focused on the YUS Conservation Area located in the Huon Peninsula in Morobe Province and in the Torricelli Mountain Range located in the Sandaun and East Sepik Provinces in the north-west of PNG. The project prepared the Draft policy framework for PNG National Biodiversity Offsets Policy.[55]⁵⁵ Project ID 5510 built upon the results of Community-based Forest and Coastal Conservation and Resource Management in Papua New Guinea (GEF ID 3954; GEF grant: USD 6,900,000; project closed in 2018). Experience gained through the R2R project provides a solid foundation with regards to community-based management of natural resources, livelihood generation and land use planning and management.

? Strengthening Integrated Sustainable Landscape Management in Enga Province of Papua New Guinea. The EU-funded project (US\$5.5m; under implementation 2021-2025) project that works across Enga province to strengthen integrated planning and agricultural development activities.

? Sustainable management of the Upper Sepik (WWF). One of the project's goals is to work with local communities to help them avoid selling off resources for short-term benefit. The project is working together with PNG's government and local stakeholders to design a river management plan for the Sepik River. This will protect biodiversity and ecological processes while promoting the sustainable

management of natural resources with the backing of a strong policy for this critical catchment area. Moreover, the project helps locals manage the sustainable collection and trade in eaglewood, a valuable NTFP.

SFM

? The PNG Multi-purpose National Forest Inventory (2015-2020; ? 7,500,000) is funded by the European Union and the UN-REDD Programme and implemented by FAO in partnership with PNGFA and with collaboration of various national and international institutions. Under the framework of the Mountain Biodiversity for REDD+, this project is part of a global effort to establish a multipurpose National Forest Inventory and a National Forest Monitoring System in PNG to measure carbon stocks and their changes over time, as well as other forest values. The project is monitoring forest biodiversity to assess the trade-offs between protecting biodiversity and reducing emissions in order to support a more sustainable management of forests in PNG.

? The Forest Carbon Partnership Facility REDD+ Readiness Project (Phases 1 and 2) (Implemented by UNDP in partnership with CCDA; funded by World Bank, US\$ 5,000,000; 2015-21) established national REDD+ management arrangements, assessed drivers of deforestation and forest degradation, prepared PNG's REDD+ Strategy, assessed Forest Reference Emission Levels, social and environmental safeguards and built the National Forest Monitoring System. The PNG National REDD+ Strategy (2017-2027) provides a framework for attracting additional funding to cater for land use planning in PNG. The Strategy emphasizes national development and land use planning where the bulk of area would be the forested areas and the introduction of carbon sequestration projects would ensure that these forest areas remain with less destruction and hence promote LDN.

Biodiversity conservation

? ?Sustainable Financing of Papua New Guinea's Protected Area Network? (GEF ID 9536; GEF grant: USD 11,311,915; under implementation 2019-2024). The objective of this project is to reduce the funding gap for Papua New Guinea's protected areas in order to improve their management effectiveness and the livelihoods of their communal landowners. This project is strengthening the capacity of CEPA to effectively plan, secure and administer funds for PNG's protected area system. This project is also designing and implementing a suite of mechanisms to improve revenue streams in the protected areas. These outcomes will form a basis to improve the management of landscapes without formal designation as protected area.

? The ?Biodiversity Conservation through Implementation of the PNG Policy on Protected Areas? project (JICA; 2015-2020) aimed at setting up effective management of the Protected Areas Network of PNG by strengthening institutional framework, enhancing the terrestrial protected area management model, and raising awareness of the people about biodiversity conservation in the Central province.[56]⁵⁶

? The ‘PNG Biodiversity Program’ (USAID; 2020-2025)[57]⁵⁷ ? The PNG Biodiversity Program's assessments will inform community engagement across three focus regions: The Bismarck Forest Corridor near Goroka, the Madang Province, and the ‘Learning Landscape’ at the Yopno, Uruwa, Som (YUS) Conservation Area. Implemented by Cardno International Development, the program presents a unique opportunity to align both conservation and development priorities ? protecting rich resources and enabling PNG to sustainably advance the development of its people. The Program aims to achieve three goals: (i) strengthen national and provincial level governments to better manage conservation areas, (ii) strengthen capacity and coordination at the provincial-level and build linkages to the National Coordinating Committee, and (iii) strengthen coordination through the Provincial Development Planning Process.

? The ‘Karimui Conservation & Resource Management Program’ (2009-ongoing) is a community-based initiative led by the people of Karimui in partnership with the non-governmental organization Partners with Melanesians. The program focuses on Mt. Karimui, in Chimbu Province, an untouched ecosystem of virgin tropical rain forests with many rare species of plants and animals. The ultimate goal of the program is to see a conservation area of 14,900 hectares formally established in Karimui.

Environmental monitoring, assessment, and offsetting

? ‘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 (CBIT)’ (GEF ID 9833; total cost US\$ \$2,413,242, of which GEF grant US\$ 863,242; 2018-2021). The objective of this project is to strengthen the agriculture and land use sector assessments, 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. The information obtained through this project will help inform the testing and scaling up of the SLM and SFM methodologies in the Project. The project is developing real-time alert monitoring system of deforestation, which the Project will capitalize on for the development of the environmental compliance monitoring and enforcement system (Output 1.1.5).

? ‘Capacity Development on Forest Resource Monitoring for Addressing Climate Change in Papua New Guinea’ (Japanese International Cooperation Agency (JICA); 2011-2014)[58]⁵⁸ ? In order to assist in effective management of PNG’s vast natural resources, JICA and PNGFA collaborated in the 2011-2014 project, combined with the Japanese Grant Aid Program that provided the project with remote sensing data, GIS equipment, and training program for the officers of PNGFA and other relevant government agencies. The project successfully developed the Nation-wide Forest Base Map[59]⁵⁹ and the National Forest Resource Information Management System (NFRIMS) - a platform essential to addressing climate change issues, especially in the development of the Measuring, Reporting and Verification system in PNG. The phase 2 of the project, titled ‘Capacity Development Project for Operationalization of PNG Forest Resource Information Management System for Addressing Climate Change’ (2014-2019), aimed at reinvigorating the capacity of PNGFA so that it

can fully operationalize 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. The major outcomes from the phase 2 project also includes carbon accounting, which is one of the indispensable elements to address climate change issues in PNG.

? PNG LNG Project Biodiversity Implementation and Monitoring Program? (BIMP) (in operation since 2010, annual budget US\$ 2,000,000): The Biodiversity Strategy of the LNG Project was developed through consultation with key stakeholders including the PNG Government, national and international NGOs, academic institutions, and local communities, and outlines how impacts on biodiversity will be assessed and managed in the long-term. An important part of the Biodiversity Strategy is the offset program, which was designed to balance the residual impacts associated with the construction of the PNG LNG Project with equivalent biodiversity gains. The overall goal of the LNG Project Biodiversity Strategy is to retain biodiversity values of the Upstream area for the long-term, focusing on the conservation of priority ecosystems in Hela and Southern Highlands Provinces (e.g. the Hides Ridge and Lake Kutubu Areas), protection of focal habitats such as caves and swamp forests, and accounting for residual impacts that could not be avoided or reduced through offset. To operationalize its Biodiversity Strategy, ExxonMobil PNG has developed a Biodiversity Implementation and Monitoring Program (BIMP) which sets out the process that will be followed to implement the biodiversity offset program, monitor residual impacts associated with the PNG LNG Project, and evaluate performance in meeting the strategy objectives. The program encompasses conservation activities at the local scale through to strengthening existing protected areas and providing new protected area development where possible. These activities are supplemented by initiatives to support conservation capacity and protected area planning at the local, regional, and national levels with the aim of enhancing conservation in PNG. The monitoring and evaluation component of the BIMP comprises several complementary quantitative and qualitative research and information collection programs, designed to provide scientifically robust data to evaluate the status of the biodiversity objectives. The offset program has a target of creating 3 offset sites at different elevation zones, one in the Montane area, in the Lower Montane area around Lake Kutubu and the third at lower elevations. Each site has a target of 50,000 hectares. Lake Kutubu is an existing protected area (Wildlife Management Area) and hence the objective there is to enhance the management and to expand the acreage. In the lower elevations, after 4 years of sustained engagement and resource mapping, 8 communities are in the process of entering into Conservation Deeds to protect about 20000 hectares while the higher montane areas awareness raising is in progress.

? The GEF-4 Project Community-Based Forest and Coastal Conservation and Resource Management in Papua New Guinea? (GEF-3954; 2012-2018; total funding US\$ 30,122,000; GEF funding US\$ 6,900,000; implemented by UNDP, executed by CEPA) delivered a report on Payment for Ecosystem Services Options and Opportunities for New Britain Island (2015).[60]⁶⁰ The report identifies options and opportunities for PES schemes on the island. A PES scheme uses the power of economic incentives to make conservation preferable over extraction of natural resources ? that is, a voluntary payment to landowners in exchange for a given environmental service. Multiple recommendations are made in the

report for how a successful PES scheme can be implemented in the face of the rich and varied complexities of the PNG context.

Agricultural development

? Market for Village Farmers Project (IFAD; total costs US\$ 46.79 million, of which IFAD funding US\$ 25.5 million; 2017-2024): The project aims at improving the livelihoods of farming households by facilitating their transition to market-oriented production and farming as a business. It supports the development of sustainable business partnerships, where farmers have secured and remunerative market options and buyers obtain a reliable and consistent supply of vegetables and other fresh produce. The project works in six provinces of Papua New Guinea: Western Highlands, Jowaka, Simbu, Eastern Highlands, Morobe and East New Britain. Around 25,000 farming households (approximately 125,000 people) directly benefit from the project.

? Productive Partnerships in Agriculture Project (World Bank, European Union and IFAD; 2010-2021; total costs US\$ 119.21, of which IFAD funding US\$ 35.96 million): The objective of this project is to improve the livelihoods of smallholder cocoa and coffee producers by enhancing the performance and sustainability of value chains in cocoa- and coffee-growing areas. These value chains are an important part of farming systems in the project area and play a critical role in helping households meet their cash requirements. To enhance rural livelihoods, the project works to: (i) strengthen coordination between the coffee and cocoa industries and related institutions; (ii) facilitate linkages between smallholder farmers and agribusiness for the provision of technologies and services; (iii) provide improvements in infrastructure to increase smallholders' access to markets. The project provides smallholder farmers, producers, women, and young people with training in more efficient, market-responsive, and sustainable production practices. For the coffee component, the project targets the provinces of Eastern Highlands, Jiwaka and Simbu. Among other things, the project has successfully introduced financing mechanisms to help farmers? access better tools and technology.

? The Transformative Agriculture and Enterprise Development Program is a multidisciplinary research program co-funded by the Australian Department of Foreign Affairs and Trade and the Australian Centre for Agricultural Research that aims to improve the livelihoods of rural men and women in Papua New Guinea. Two projects under this program target the highlands of PNG:

? The Sweet Potato Project (2016-2021; AUS \$5 million) aims to sustainably increase the contribution that sweet potato makes to cash income and food security, by improving sweet potato value chains. This will improve the livelihoods of sweet potato producers and their communities in the highlands of PNG.

? The Cocoa Project (2016-2021; AUS \$4.9 million) aims to make smallholder cocoa enterprises in the Chimbu Province, among others, more productive and profitable.

? Agriculture Commercialization and Diversification Project (World Bank; US \$40 M; 2020-2025) aims at increasing the productivity and access to markets of target smallholder farmers and SMEs for selected agricultural value-chains, including coffee and cocoa, in selected economic corridors. The project works on capacity development, construction of agricultural feeder roads and the establishment of partnerships for integrated value chains. Among other provinces, the project works in Southern

Highlands Province. The project may expand its scope to support to livestock, spices, rubber, and coconut sectors.

? Support to Rural Entrepreneurship, Investment and Trade in Papua New Guinea (STREIT) (European Union; US\$ 89,800,589; 2019-2014) project focuses on women, youth and climate change in the particularly vulnerable Momase region of Papua New Guinea aiming to improve sustainable and inclusive economic development and job creation. The activities of the project will focus on increased economic return from cocoa, vanilla, and fisheries value chains. They will help to create and strengthen climate-resilient, more efficient, sustainable, and inclusive value chains with improvements to infrastructure and renewable energy. The project is implemented as a United Nations Joint programme.

Remaining gaps

The problem tree presented in **Figure 1** and the baseline investments define key remaining baseline gaps for enabling SLM, SFM and NCA and their linkage to integrated landscape management include:

- ? Lack of integrated landscape governance management that results from:
 - ? Missing policy mandate establishing integrated land use planning as the fundamental planning, implementation, and monitoring framework to define, guide, and track progress towards strategic priorities of land use,
 - ? Missing regulations and guidelines specifying the implementation of relevant legislation,
 - ? Inoperational cross-sectoral land-use planning platform at the national and non-existing platforms at the provincial levels,
 - ? Critical data for environmental planning and monitoring to prevent biodiversity loss and forest and land degradation is scattered, absent, or outdated.[61]⁶¹
 - ? Unaddressed land conflicts resulting from land tenure
 - ? Land use interests by land-based production sectors remain uncoordinated at the landscape level leading to a sectoral approach to land management
 - ? Compliance monitoring and enforcement of environmental laws and regulations remains a challenge[62]⁶² due to the lack of capacities and of cross-sectoral coordination, including the exchange of information.
 - ? Limited information, capacities, and practical experience on scalable SLM and SFM technologies, particularly for the Highlands,
 - ? Lack of understanding of the costs incurred by nature:
-

- ? Very limited awareness on the true value of natural capital and how it influences human livelihoods, particularly among the rural population,
- ? Limited capacities on and practical experience with NCA approaches among key government organizations,
- ? No awareness, capacities, and experience in applying NCA in the private sector,
- ? Insufficient and unsustainable economic incentives for sustainable land use
- ? Lack of perceived economic rationale for landowners to engage on SLM and SFM,
- ? Lack of sustainable financing to overcome the barrier of engaging on SLM and SFM,
- ? Limited efforts to advance participation in decision-making and sharing of benefits from land and natural resources by women.

3) Proposed alternative scenario with a brief description of expected outcomes and components of the project

Strategy Options and Causal Pathways

The lack of understanding of ecosystem values and lack of integrated landscape management lead to biodiversity loss and land degradation in PNG Highlands, which were identified as the main environmental problems to be tackled by the Project. The Project selected the causal pathway of integrated landscape management as a vehicle for upscaling LDN across PNG Highlands by building an enabling legal and regulatory environment for land use planning that integrates environmental assessment and natural capital assessment through scenario analyses, by building capacities and gathering and making available a broad information base that support the wide-scale practice of SLM and SFM, and by gaining and propagating an understanding of local natural capital values (shown as the 'Integrated Landscape Management Pathway' in **Figure 11**). Ultimately, LDN will be achieved through the effective governance of land and biodiversity assets, the strengthening of rural livelihoods through sustainable biodiversity-friendly value chains that equitably benefit women, and the application of SLM and SFM approaches and technologies over large tracts of Hela and Southern Highlands Provinces. The objective tree presented in **Figure 11** derived from the problem tree in **Figure 1** graphically describes hierarchic objectives along with the impact pathway chosen by the Project.

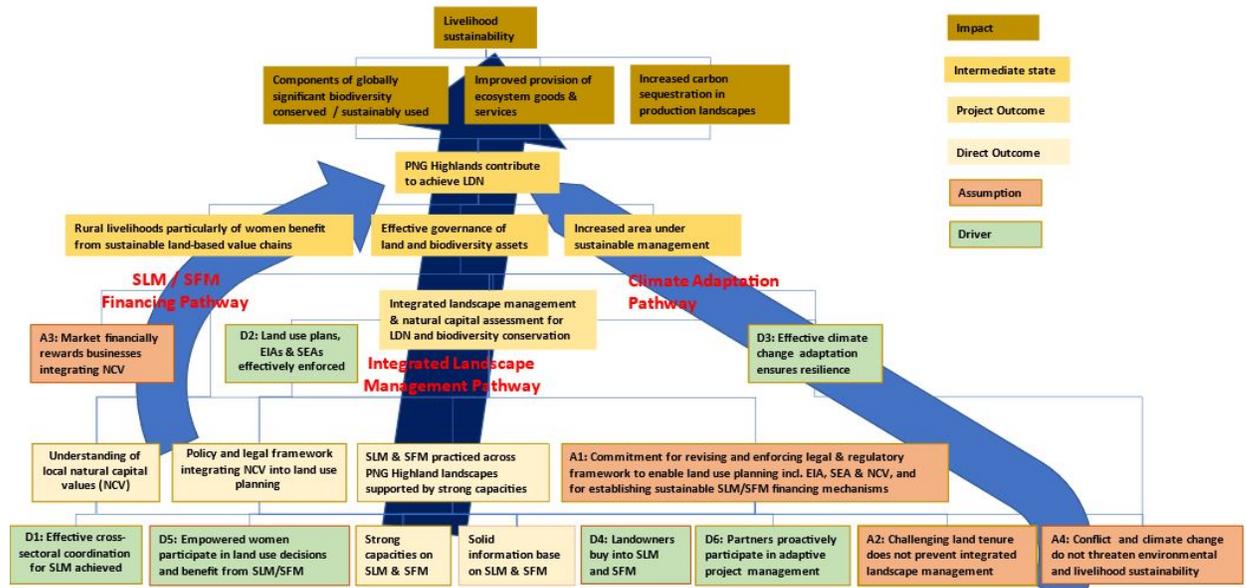


FIGURE 11: OBJECTIVE TREE INCLUDING IMPACT PATHWAYS.

In terms of the solution, strong capacities on SLM and SFM, coupled with a solid information base on the same subjects will contribute to the upscaling of SFM and SLM technologies across Highland landscapes, an enabling policy, legal and regulatory environment for land use planning that integrates monitoring and enforcement of environmental provisions, and an understanding of NCA in the local context. This will lead to integrated landscape management that integrates NCA and enables the achievement of LDN along with biodiversity conservation. Ultimately, the results will include effective governance of land and biodiversity assets, strengthened rural livelihoods through sustainable land-based value chains that benefit women and an increased area under SLM and SFM practices (shown as the 'Integrated Landscape Management Pathway?'). Alternative pathways include the 'SLM/SFM Financing Pathway?' and the 'Climate Adaptation Pathway?'. The first alternative pathway would help to curb unsustainable land use practices by providing financial incentives for sustainable land use, and thereby improve the flow of ecosystem services. However, this pathway would miss out on explicitly working towards LDN targets and accounting for the spatial interdependence of landscape elements, as sustainable financing would not automatically need to be embedded in a spatial planning context. On the other hand, the Climate Adaptation Pathway would help to ensure that land-based practices and investments are climate proofed, and that the resilience against climate change of social-ecological systems in PNG Highlands is increased. While none of the alternative pathways can be considered entirely isolated from the Integrated Landscape Management Pathway, following them would yield sectoral investments that do not account for the spatial interdependence of landscape elements and the resulting negotiated priorities based on the common understanding of stakeholders. Though the two alternative pathways are not the main strategies chosen by the Project, key components of both are embedded within the Project strategy.

Theory of Change

The objective of the proposed project is to support the introduction and scaling-up of innovative sustainable land and forest management practices to help achieve PNG's voluntary LDN targets and improve ecosystem services. The Project will create an enabling environment to improve land use planning and biodiversity conservation and by integrating natural capital assessment (NCA), Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA) processes. Natural capital valuations will be done in biodiversity priority areas. The proposed project will also pilot an integrated approach to sustainable land and forest management in the Highlands region to revert land degradation and prevent further deforestation through shifting agriculture. The results of this project

will enable scaling-up sustainable land management (SLM) and sustainable forest management (SFM) approaches across the country to help PNG achieve its LDN targets and conserve its natural capital.

The Project's **impacts** at intermediate state include i) effective governance of land and biodiversity assets in PNG Highlands, ii) increased area under sustainable management practices that ensures the sustainable flow of ecosystem services, and iii) rural livelihood benefits from sustainable land-based value chains that equitably benefit women. At the intermediate state, the Project will also contribute to the achievement of targets under the UNEP Programme of Work 2020-2021, particularly under Subprogramme 3 'Healthy and Productive Ecosystems'. In terms of impacts, the Project will contribute to the sustained flow of ecosystem services in PNG Highlands that will provide a solid basis for sustainable livelihoods and to the achievement of LDN. At the global scale, the Project will contribute to the achievement of GEF Global Environmental Benefits, including the conservation and sustainable use of globally significant biodiversity, the improved provision of ecosystem services, and to carbon sequestration benefits. In total, 84,409 ha of land will benefit from restoration and improved management. The Project impacts also contribute to the achievement of global development objectives structured along the Sustainable Development Goals, particularly SDG 15 'Life on Land', SDG 2 'Zero Hunger' and SDG 13 'Climate Change'. The details of the Project's SDG contributions are described in **Section 3.1**.

The **drivers**, which will contribute to the achievement of and be influenced by the hierarchic set of results described above include:

- ? Driver 1 'Effective cross-sectoral coordination for SLM achieved.?
- ? Driver 2 'Provisions of land use plans, EIAs and SEAs are effectively enforced by authorities.?
- ? Driver 3 'Effective adaptation to climate change ensures the resilience of project investments.?
- ? Driver 4 'Landowners buy into the piloting of SLM and SFM approaches and techniques involving their land.?
- ? Driver 5 'Empowered women participate in land use decisions and benefit from SLM/SFM.?
- ? Driver 6 'Project partners proactively participate in adaptive management to successfully deliver project results.?

All drivers influence the achievement of results at the Outcome level. The Project will be in the position to exert influence on all drivers, which however will not be entirely under its control. Most crucially, the Project will utilize awareness raising, capacity development, and incentive mechanisms to ensure landowners' buy-in into the SLM and SFM approaches, and techniques propagated by the Project. The Project will strongly encourage the break-down of sectoral silos and foster cross-sectoral collaboration, including on the preparation of land use plans, the monitoring of their implementation and the enforcement of their provisions along with those resulting from environmental assessment processes. The Project will base all SLM and SFM interventions on a solid climate vulnerability assessment to ensure that all investments are climate proofed, however major disruptions due to climate change cannot be entirely overcome through adaptive measures. The Project targets to break structures and processes that discriminate against women and prevent them from effectively participating in land use decisions and reaping benefits from land use by fostering their participation in the formal land-based economy and institutionalizing their participation in land use planning. However, it is unrealistic to expect that social norms that lead to gender discrimination can be broken down by the Project. The Project will invest into bringing on board a broad array of partners and to facilitate their active participation throughout project implementation, as described in Appendix 21 Stakeholder Engagement Plan. However, their active buy-in can only be partially influenced by the Project.

The Project's Theory of Change makes explicit **assumptions** about external factors that need to be in place to achieve the intended results. These include:

? Assumption 1 ?The government maintains commitment towards integrated landscape management including SLM and SFM, improved environmental monitoring and enforcement, and internalizing the true value of natural capital in economic decisions.?

? Assumption 2 ?Challenging current land tenure does not prevent integrated landscape management and the adoption of SLM and SFM technologies.?

? Assumption 3 ?Market demand financially rewards businesses integrating natural capital valuation in their business plans.?

? Assumption 4 ?Conflict and climate change do not threaten environmental and livelihood sustainability.?

The Theory of Change takes Assumption 4 at the level of Intermediate State whereas all other Assumptions are made as a precondition to achieve various Outcomes. **Figure 12** graphically presents the Project's Theory of Change.

Key stakeholders contribute to the Theory of Change in the following manner (for more details, refer to separately provided **UNEP Project Document Appendix 21** Stakeholder Engagement Plan, Exhibit 3):

? Landowners: an enabling environment, improved understanding, skills, piloted technologies, and financial incentives result in land use decisions in favour of SLM and SFM.

? Government Departments: an enabling policy, legal, regulatory, and institutional environment, a readily accessible comprehensive information base, skills and knowledge in land use planning, SLM, SFM and NCA, coupled with effective monitoring, and enforcement result in regulating land use based on SLM & SFM that safeguards biodiversity and ensures upscaling towards LDN.

? Private sector, including interest groups: a policy, legal and regulatory environment that enables the integration of NCA into land use decisions, readily available information and knowledge on NCA, a facilitatory approach followed by government agencies, financial incentive mechanisms and increased capacities to capitalize on NCA in business planning will lead to a paradigm shift in business planning integrating NCA and to the sourcing of products from SLM and SFM for sustainable value chains, which will thus become the new mainstream land-based business approach.

? PNG Highland public, including women in targeted landscapes: improved understanding of the biodiversity values and SLM/SFM for livelihoods, along with gender action leads to equitable livelihood benefits across gender groups from sustainable land-based value chains.

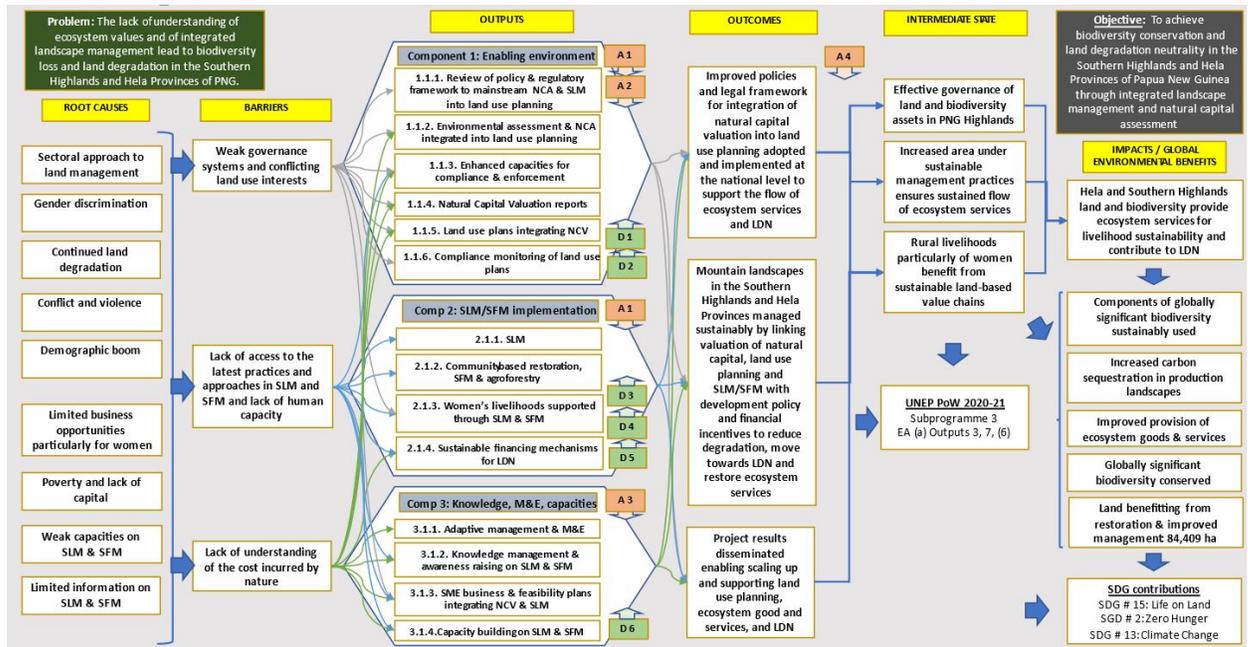


Figure 12: Theory-of-Change graphical presentation.

Alternative scenario

The PPG Phase led to the modification of the Results Framework against the PIF as presented in the Table below.

WORDING IN THE pif	changes	eXPLANATION
Project objective: To achieve biodiversity conservation and land degradation neutrality in the Southern Highlands and Hela Provinces of Papua New Guinea through integrated landscape management and natural capital assessment	None	
Component 1: Enabling environment to support the flow of ecosystem goods and services and achieve land degradation neutrality (LDN)	None	
Outcome 1.1: Improved policies and legal framework for integration of natural capital valuation into land use planning adopted and implemented at the national level to support the flow of ecosystem services and LDN	None	
Output 1.1.1. Review of national/sector policies, legislation, and procedures to integrate natural capital values and sustainable land management principles into land use planning to reduce land and forest degradation and improve the flow of ecosystem goods and services.	Output 1.1.1: A review of national/sector policies, legislation, and procedures to integrate natural capital values and sustainable land management principles into land use planning to reduce land and forest degradation and improve the flow of ecosystem goods and services is available to stakeholders.	? Adjusted language in line with UNEP RBM practice. ? Output purpose explanation was moved to description of project components (Project Document Section 3.3) to keep logframe length at bay.

<p>Output 1.1.2. Multi-agency strategic environmental assessment (SEA), environmental impact assessment (EIA) and natural capital assessment (NCA) processes developed that integrate natural capital valuation, to feed into land use planning and development strategies to strengthen coordination towards LDN and biodiversity conservation.</p>	<p>Output 1.1.2. Multi-agency strategic Stakeholders can access environmental assessment (SEA), environmental impact assessment (EIA) and natural capital assessment (NCA) processes developed that integrate natural capital valuation, to feed into land use planning and development strategies to strengthen coordination towards LDN and biodiversity conservation.</p>	<p>? Adjusted language in line with UNEP RBM practice</p> <p>? Removed details from Output wording</p>
<p>Output 1.1.3. Capacity and know-how enhanced in the Conservation and Environment Protection Authority and other relevant central government agencies as well as at provincial government level, taking into account gender balance, to apply SEA, EIA and NCA, that integrate natural capital valuation, to support decision-making in the processing of environmental permit applications, as well as for compliance monitoring, environmental audits and enforcement.</p>	<p>Output 1.1.3: Capacity and know-how enhanced in the Conservation and Environment Protection Authority and other relevant central and provincial government agencies as well as at provincial government level, benefit from gender-responsive capacity and knowhow development taking into account gender balance, to apply for environmental assessment integrating natural capital valuation, to support decision-making in the processing of environmental permit applications, as well as for compliance monitoring, environmental audits and enforcement.</p>	<p>? Adjusted language in line with UNEP RBM practice.</p> <p>? Shifted detailed list of environmental assessment procedures to descriptive text and clumped them as ?environmental assessment? in the Output title.</p>
<p>Output 1.1.4. Natural capital valuation reports with scenario analysis produced for mountain landscapes showing the value of biodiversity and its ecosystem goods and services.</p>	<p>Output 1.1.4: Natural capital valuation reports with scenario analysis is produced for mountain landscapes showing the value of biodiversity and its ecosystem goods and services in mountain landscapes are available to affected stakeholders</p>	<p>? Adjusted language in line with UNEP RBM practice.</p>
<p>Output 1.1.5. Comprehensive land-use plans integrating the results of natural capital valuation with scenario analyses for different land-use options, and SLM and SFM principles developed for mountain landscapes.</p>	<p>Output 1.1.5. Affected stakeholders in mountain landscapes benefit from comprehensive land-use plans integrating the results of natural capital valuation with scenario analyses for different land-use options, and SLM and SFM principles developed for mountain landscapes.</p>	<p>? Adjusted language in line with UNEP RBM practice.</p>

<p>Output 1.1.6. Stronger system for compliance monitoring and enforcement developed and implemented, in collaboration with relevant authorities and provincial governments, as part of multi-stakeholder land use planning and management systems to support LDN and ensure that ecosystems goods and services are sustained.</p>	<p>Output 1.1.6. A stronger system for compliance monitoring and enforcement developed and implemented, in collaboration with relevant authorities and provincial governments, as part of multi-stakeholder land use planning and management systems to support LDN and ensure that ecosystems goods and services are sustained is available to relevant authorities and provincial governments.</p>	<p>? Adjusted language in line with UNEP RBM practice.</p> <p>? Output purpose explanation was moved to description of project components (Project Document Section 3.3) to keep logframe length at bay.</p>
<p>Component 2: Natural capital valuation and implementation of sustainable land and forest management (SLM/SFM) practices in mountain landscapes of the Southern Highlands and Hela Provinces</p>	<p>None</p>	
<p>Outcome 2.1: Mountain landscapes in the Southern Highlands and Hela Provinces managed sustainably by linking valuation of natural capital, land use planning and SLM/SFM with development policy and financial incentives to reduce degradation, move towards LDN and restore ecosystem services</p>	<p>None</p>	
<p>Output 2.1.1. SLM practices implemented by 10,000 households of landowners and farmers in 50,000 hectares to restore soil fertility, improve income by 20% and move towards environmentally sound production.</p>	<p>Output 2.1.1. SLM practices through restored soil fertility, improved income and environmentally sound production implemented by 10,000 households of landowners and farmers in 50,000 hectares to restore soil fertility, improve income by 20% and move towards environmentally sound production demonstrated to landowners and farmers.</p>	<p>? Adjusted language in line with UNEP RBM practice.</p> <p>? Removed targets and placed them under indicator targets.</p>
<p>Output 2.1.2. Community-based restoration of 50,000 hectares of degraded forests through SFM and agroforestry.</p>	<p>Output 2.1.2. Communities benefit from community-based restoration of 50,000 hectares of degraded forests through SFM and agroforestry.</p>	<p>? Adjusted language in line with UNEP RBM practice.</p> <p>? Removed targets and placed them under indicator targets.</p>

Output 2.1.3. Gender-sensitive strategies for SLM and SFM developed and implemented at project sites to improve the livelihood of women.	Output 2.1.3. Gender-sensitive strategies for SLM and SFM demonstrated at project sites to improve the livelihood of women foster women's livelihood improvement.	? Adjusted language in line with UNEP RBM practice.
Output 2.1.4. Piloting of sustainable financing mechanisms for LDN (e.g. permits fees, credits, subsidies, microloans, certification, biodiversity offsets) as a means to allow scaling-up practices and incentives to restore degraded land and ecosystem services.	Output 2.1.4. Stakeholders benefit from piloted Piloting of sustainable financing mechanisms for LDN (e.g. permits fees, credits, subsidies, microloans, certification, biodiversity offsets) as a means to allow scaling-up practices and incentives to restore degraded land restoration and ecosystem services.	? Adjusted language in line with UNEP RBM practice ? Explanatory details were moved from Output title to description of project components (Section 3.3 Project Document)
Component 3: Knowledge management, monitoring and evaluation, awareness raising and training	None	
Outcome 3.1: Project results disseminated enabling scaling up and supporting land use planning, ecosystem good and services, and LDN	None	
Output 3.1.1. Project results monitored and evaluated in a participatory manner, with input from communities, land owners and other stakeholders, and communicated to showcase the outputs and outcomes.	Output 3.1.1. Effective results-based adaptive management and dissemination of results supported by participatory monitoring and evaluation system Project results monitored and evaluated in a participatory manner, with input from communities, land owners and other stakeholders, and communicated to showcase the outputs and outcomes.	? Adjusted language in line with UNEP RBM practice ? Removed stakeholder details and placed them in the descriptive text on the output.

<p>Output 3.1.2. Awareness raising and technical materials, based on best-practices identified through Component 2, developed in local languages, disseminated and used for training of landowners and communities, taking into account gender balance, to promote adoption of SLM and SFM practices.</p>	<p>Output 3.1.2. Stakeholders effectively absorb knowledge and best practices emerging from the project to implement SLM and SFM. Awareness raising and technical materials, based on best-practices identified through Component 2, developed in local languages, disseminated and used for training of landowners and communities, taking into account gender balance, to promote adoption of SLM and SFM practices.</p>	<p>? Adjusted language in line with UNEP RBM practice.</p> <p>? Split Output between knowledge management and capacity development of local stakeholders between Outputs 3.1.2 and 3.1.4.</p>
<p>Output 3.1.3. Training, using gender sensitive approaches, for small and medium-sized enterprises on how to integrate natural capital valuation and SLM principles into feasibility plans and business models.</p>	<p>Output 3.1.3. Training, using gender sensitive approaches, for Small and medium-sized and large enterprises are able to integrate natural capital valuation and SLM principles into feasibility plans and business models.</p>	<p>? Adjusted language in line with UNEP RBM practice.</p>
<p>Output 3.1.4. Natural capital valuations and best practices in SLM/SFM will be shared through a national database</p>	<p>Output 3.1.4. Natural capital valuations and best practices in SLM/SFM will be shared through a national database. Landowners and communities benefit from gender responsive capacity building on SLM and SFM in local languages</p>	<p>? Output on database reduced to activity level (Activity 3.1.2.4) as database will be developed by GEF-10151 and GEF-10580 will contribute a module to it for best practices of SLM, SFM and NCA.</p> <p>? Replaced Output with capacity development of local stakeholders.</p>

The alternative scenario defined by the Project will create an enabling environment for SLM and SFM and deliver viable solutions ready for upscaling, supported by enhanced capacities and knowledge. The alternative project scenario will contribute to the implementation of Papua New Guinea's Land Degradation Neutrality transformative strategy, which focuses on the identification of priority areas for feasible LDN investments and incorporating and up-scaling best practices to achieve LDN. The proposal was formulated following guidance provided by the UNCCD Global Mechanism for LDN transformative projects and programmes that encourage innovation, ensure consistency and completeness in the implementation of LDN and support positive transformation by (i) ensuring transformation and innovation; (ii) promoting responsible and inclusive governance; (iii) ensuring sustainability; and (iv) leveraging innovative finance, especially from the private sector. The

alternative scenario will be achieved by overcoming the three identified barriers in a systemic manner, using a multi-pronged approach that will result in one project Outcome to overcome each of the three barriers:

Component 1 will ensure that the enabling environment for landscape management integrating SLM, SFM and NCA is fully established, including the revision of relevant policies, laws and regulations. Land use planning based on land use scenarios defined by the true value of natural capital established through NCA studies and integrating environmental assessment processes (EIA and SEA) will be introduced. The implementation of and accountability towards land use plans and environmental assessment processes will be strengthened by an improved compliance monitoring and enforcement system and by enhanced capacities of involved government organizations.

Outcome 1.1: Improved policies and legal framework for integration of natural capital valuation into land use planning adopted and implemented at the national level to support the flow of ecosystem services and LDN?

? Output 1.1.1: A review of policies, legislation, and procedures to integrate natural capital values and sustainable land management principles into land use planning is available to stakeholders. The review of the policy, legal and regulatory framework will focus on i) firmly anchoring NCA as an economic decision-making approach, as well as SEA in the policy, legal and regulatory framework, ii) making proposals to adjust the policy, legal and regulatory framework to ensure compliance with SLM, SFM and biodiversity conservation principles, including through integrated land use planning, iii) updating relevant strategies to trigger the translation of these principles into practical action on the ground, iv) ensure mainstreaming of LDN and biodiversity conservation into institutional frameworks. Consultations on items of the policy, legal and regulatory framework will take a highly participatory approach and include representatives of local communities. For provincial-level items of the policy, legal and regulatory framework, community-level consultations will be conducted throughout Hela and Southern Highlands Provinces.

? Output 1.1.2 Stakeholders can access environmental assessment processes to feed into land use planning. Multi-agency strategic environmental assessment (SEA), environmental impact assessment (EIA) and NCA processes will be developed and integrated into land use planning and development strategies to strengthen coordination towards LDN. This will prevent land degradation and identify options for landscape rehabilitation and regeneration. The project will benefit from several mechanisms that are being put in place to measure progress and track achievements towards LDN. These include the development of provincial forest management plans, satellite monitoring of the logging activities, improved regulations on environmental permit, and enforcement of permit conditions. Furthermore, information and data regarding the state of the environment being uploaded by CEPA, other government agencies and stakeholders into the PNG Data Portal will serve as basis for the natural capital assessments. The TerraPNG web portal will also contribute with information on land use and land cover, and the PNG REDD+ web portal will contribute with data from the national forest monitoring system. The project will also identify opportunities for biodiversity and social gains, reducing the negative impacts on other land uses (e.g. agricultural production), provision of ecosystem goods and services, and livelihoods.

? Output 1.1.3: Conservation and Environment Protection Authority and other relevant central and provincial government agencies benefit from gender-responsive capacity and knowhow development for environmental assessment, compliance monitoring, and enforcement. Institutional and individual capacities and know-how in the CEPA, other relevant central and provincial government agencies, and

institutions mandated with overseeing land-based production sectors will be enhanced through training courses. The Output will focus on building capacities to conduct EIA, SEA and NCA processes; processing of environmental permit applications; land use planning; as well as on compliance monitoring and enforcement. The sustainable development of capacities will be ensured by converting individual trainings into a formal training programme consisting of periodic refresher courses for relevant staff. This training programme will benefit from a system of continuous capturing, curating, and disseminating institutional knowledge as an evolving body of useful information that is made accessible to people as they join organizations over time.

? Output 1.1.4: ?Natural capital valuation reports with scenario analyses showing the value of biodiversity and its ecosystem goods and services in mountain landscapes are available to affected stakeholders.? The Output will deliver natural capital valuation reports on priority landscapes across the Southern Highlands and Hela Provinces to quantify the value of biodiversity and of ecosystem goods and services generated by it. A review will be done to identify key lessons learned from the valuation of natural capital around the world and identify key datasets that can be adapted to PNG's context. Subsequently, assessments of the natural capital of mountain landscapes in the Highlands region will be carried out. The NCA assessments will highlight dependencies and values between the environment and the most relevant economic sectors (e.g. agriculture, mining, oil and gas, and tourism) and their role in a transformation towards LDN. The analyses will identify the current land use regimes at the target sites, as well as the state of biodiversity and the socio-economic scenarios, with a view to determining the key project stakeholders and the actual conservation and land-use requirements on-site.

? Output 1.1.5: ?Affected stakeholders in mountain landscapes benefit from comprehensive land-use plans integrating the results of natural capital valuation with scenario analyses for different land-use options, and SLM and SFM principles.? The key products of this Output are comprehensive vertically and horizontally integrated land use plans that maximize ecosystem service provision based on SLM and SFM principles. Land use plans will build on solid scenario analyses, which in turn are informed by the results of NCV exercises and integrate EIA and SEA processes. Land use plans will promote good governance and facilitate the mitigation of land tenure conflicts through broad-based public participation and social equity provisions, including for women, and be governed, and guided by a strong enabling environment. The Project will deliver participatory land use plans for the 6 Districts targeted by the Project and integrate them at the Provincial level in Hela and Southern Highlands Provinces. A strong participatory approach to land use planning applying participatory GIS, scenario planning and structured multi-stakeholder decision-making processes will be key to the overall success of the project and the only hope of overcoming the challenges associated with customary land ownership. Scenario analyses will apply NCA results to allow transparent multi-stakeholder decisions based on a careful weighing of the economic trade-offs of certain land use choices against each other. In case land use choices that lead to local decline in natural capital values cannot be avoided, land use plans will provide guidance for biodiversity impact abatement programmes to channel the offsetting of these losses in a spatially explicit manner. Land use planning will be firmly anchored in the institutional framework and linked to institutionalized processes to ensure sustainability.

? Output 1.1.6 ?A stronger system for compliance monitoring and enforcement of multi-stakeholder land use planning and management systems is available to relevant authorities and provincial

governments.? In collaboration with relevant central and provincial government authorities, LDN will be promoted through a stronger system for compliance monitoring and enforcement as part of multi-stakeholder land use planning and management systems to ensure that the targeted benefits are sustained. This will include monitoring of conditions arising from the land use plans, SEA/EIA/NCA processes and permitting systems.

Component 2 will upscale SLM and SFM technologies across a cumulated area of 84,409 ha in the two targeted Provinces in the PNG Highlands. Introduced SLM and SFM technologies will focus on soil and water conservation, soil fertility management, integrated farming, cash crops integrated into agroforestry systems, as well as community-based forest restoration and management. Engagement on SLM and SFM and particularly income generation from them will be enabled through the implementation of a livelihood strategy specifically targeting women. Sustainable financing mechanisms, including by channelling offsetting funds from large extractive industries towards land-based Small and Medium Enterprises will remove economic hurdles that currently prevent the embracing of SLM and SFM technologies and the achievement of sustainable livelihoods based on these.

Outcome 2.1 ?Mountain landscapes in the Southern Highlands and Hela Provinces managed sustainably by linking valuation of natural capital, land use planning and SLM/SFM with development policy and financial incentives to reduce degradation, move towards LDN and restore ecosystem services?

? Output 2.1.1: ?SLM practices through restored soil fertility, improved income, and environmentally sound production demonstrated to landowners and farmers.? Collaboration with farmers and landowners will be established to rehabilitate degraded farmland and restore soil fertility in 39,667 hectares. 22,000 landowners / farmers (including 12,000 women) will be targeted for field-based interventions. The proposed interventions will be a ?menu? of technical options for restoration that can only be widely adopted on a large scale if they are adaptable, flexible, and testable by farmers under their own heterogeneous economic, social, and environmental conditions. The project will also promote the exchange of land improvement practices that have been successfully implemented in the PNG?s highlands for millennia.

? Output 2.1.2: ?Communities benefit from community-based restoration of degraded forests through SFM and agroforestry.? The Output will deliver the restoration of degraded forests on 50,000 hectares through SFM and agroforestry utilizing native species. SFM will focus on restoring native forest vegetation, whereas agroforestry will focus on creating diverse and well-tested assemblages of native and naturalized exotic species. These nature-based solutions will enhance resilience and thereby ensure climate proofing of project interventions. Community-based forest management plans will protect vegetation and soil resources from uncontrolled grazing, excessive harvesting of wood for fuel, logging and clearing of steep slopes for cultivation. In parallel, innovative sustainable forest management practices and new agroforestry systems will be introduced, tested, and evaluated.

? Output 2.1.3: ?Gender-sensitive strategies for SLM and SFM demonstrated at project sites to foster women's livelihood improvement.? The Output will deliver a revision and expansion of the Gender Analysis, Strategy and Engagement Plan (Appendix 22) prepared during the PPG Phase, with support

of the UNCCD Global Mechanism. Building on this, gender-sensitive sustainable livelihood strategies for local communities will be developed and implemented at project sites. The activities will be aimed at improving women's abilities to enhance sustainable land productivity for subsistence, increase cash crop production, and develop land-based value chains benefitting women.

? Output 2.1.4. ?Stakeholders benefit from piloted sustainable financing mechanisms for LDN to incentivize land restoration?. The Output will pilot sustainable financing mechanisms to allow upscaling towards LDN, including by tapping on relevant lessons learnt from other projects. The Output will target agricultural SMEs as beneficiaries and large industries as financiers of the financing mechanisms. These mechanisms will provide the means for scaling-up and replicating best practices for rehabilitation of degraded land, the prevention of further degradation and progress towards LDN.

Component 3 will deliver upscaling towards LDN through effective monitoring of project implementation, awareness creation on the Project's key message, and making available project lessons including by using them in capacity development. Upscaling towards LDN will further be supported by increasing the capacities of agriculture-based Small and Medium Enterprises to integrate NCV into business planning and a national database that makes reports on SLM, SFM and NCA readily available to stakeholders.

Outcome 3.1: ?Project results disseminated enabling scaling up and supporting land use planning, ecosystem good and services, and LDN?

? Output 3.1.1: ?Effective results-based adaptive management and dissemination of results supported by participatory monitoring and evaluation system.? A project monitoring and evaluation plan will be implemented in a participatory manner, with input from communities, landowners, and other stakeholders, to measure project progress and impacts in terms of multiple global environmental benefits, and social and economic benefits. Baseline and targets for project indicators, which will be refined during the inception phase, will be used for monitoring progress and impacts, and reporting through annual project reports and half-yearly project progress reports. A mid-term and terminal evaluation will be conducted and will include the review of project reports, web-based information, and field visits to selected sites, with recommendations for ensuring sustainability of project outcomes. A communication strategy will be developed and implemented to showcase the outputs and outcomes of the Project.

? Output 3.1.2. ?Stakeholders effectively absorb knowledge and best practices emerging from the project to implement SLM and SFM?. Building awareness and developing capacities on the value and benefits of natural capital assets including forests and trees in landscapes, the costs of land degradation, and the potential returns on investments in restoration and SLM/SFM will effectively contribute to upscaling towards LDN. Best practices arising from Outcome 2 will serve as the basis for the development and dissemination of awareness raising and technical materials in local languages. These materials will be used to deliver training to landowners and communities to promote adoption of SLM and SFM practices, including, etc. Using established outreach strategies for communicating at a local scale, considering the stakeholder engagement plan and gender dynamics, the project will communicate natural capital valuations, including the extent, condition and value of natural capital that are most important to the local communities and small farmers. This information will be presented in a range of

knowledge management products, including awareness materials, best practice notes, and videos, aiming at disseminating key project messages, increasing awareness, knowledge, and capacities of specific targeted stakeholders.

? Output 3.1.3 ?Small and medium and large sized enterprises are able to integrate natural capital valuation and SLM principles into feasibility plans and business models?. The project will contribute to private sector development and inclusive growth in the natural resources sector. This will be done through capacity building, outreach and awareness raising targeting SME in the agricultural sector to improve their competitiveness, productivity, and access to financial services, and deepen economic participation of women and youth. Training for Small and Medium-sized Enterprises (SMEs) and women?s groups working on land and natural resources will be carried out in a cross-sectoral approach to integrate natural capital valuation and SLM principles in the development of feasibility plans and business models. Natural capital-based tools will be made available for businesses to support integrating natural capital values into their business models.

? Output 3.1.4: ?Landowners and communities benefit from gender responsive capacity building on SLM and SFM in local languages.? Gender equality will be promoted during the trainings, visits, etc., as well as through leadership and empowerment capacity building activities to promote women?s leadership and challenge the existing status quo so that women contributions to the community become more visible and valued and women?s status will increase in all activity areas.

The Project will apply a multi-partner implementation approach involving key government and non-government stakeholders, that will overcome limitations resulting from disjunct institutional linkages between the federal and provincial levels, limitations on existing capacities, and strong sectoral silos. Risks related to the challenging land tenure situation of the PNG Highlands will be overcome by applying full FPIC procedures at the community level, agriculture-based livelihood development targeting women, and sustainable financing mechanisms targeting SMEs and landowners to engage on SLM and SFM technologies.

4) Alignment with GEF focal area and/or Impact Program strategies

The Project is aligned with the GEF 7 Land Degradation (LD) and Biodiversity (BD) Focal Areas. Under LD, the Project contributes to Focal Area Objective 1 ?Support on the ground implementation of SLM to achieve LDN?. More specifically, the Project contributes to the applicable subordinate Focal Area elements LD-1-1 ?Maintain or improve flow of agro-ecosystem services to sustain food production and livelihoods through Sustainable Land Management? and LD-1-2 ?Maintain or improve flow of ecosystem services, including sustaining livelihoods of forest-dependent people through Sustainable Forest Management (SFM).? The Project under Component 2 will introduce, test, and evaluate SLM and SFM approaches and techniques. The specific Project contributions to LD-1-1 include (for details of delivered Outputs refer to **Section 3.3**):

? Output 2.1.1. SLM practices through restored soil fertility, improved income, and environmentally sound production demonstrated to landowners and farmers.

The specific Project contributions to LD-1-2 include:

? Output 2.1.2. Communities benefit from community-based restoration of degraded forests through SFM and agroforestry.

? Output 2.1.3. Gender-sensitive strategies for SLM and SFM demonstrated at project sites to foster women's livelihood improvement.

Additionally, the Project is aligned with the LD Focal Area Objective 2 ?Creating an enabling environment to support voluntary LDN target implementation? and specifically with the subordinate Focal Area element LD-2-5 ?Create enabling environments to support scaling up and mainstreaming of SLM and LDN?. The Project?s contributions are reflected under Components 1 and 3, which aim at creating an enabling environment to support land use planning and LDN target implementation and sharing knowledge and experience to enable scaling-up. The Project will link environmental assessment processes to voluntary LDN targets and results will inform policy and fiscal instruments to mitigate perverse incentives leading to biodiversity loss and land degradation. The Project will involve building capacity in landscape assessment, management, and associated monitoring and enforcement. Capacity and know-how of relevant government agencies, at national and provincial levels, will be enhanced through training courses on SEA, EIA, and NCA to support decision-making in the processing of environmental permit applications, as well as for compliance monitoring, environmental audits, and enforcement. Upscaling will be further enabled through guidelines and codes of practice for sector industries to mainstream biodiversity valuation and LDN. Ultimately, lessons learnt, and experiences gained in the mountain landscapes of the Highlands region will enable scaling-up to the rest of the country. The Project will specifically contribute to these through:

? Output 1.1.1. A review of policies, legislation, and procedures to integrate natural capital values and sustainable land management principles into land use planning is available to stakeholders.

? Output 1.1.5. Affected stakeholders in mountain landscapes benefit from comprehensive land-use plans integrating the results of natural capital valuation with scenario analyses for different land-use options, and SLM and SFM principles.

? Output 1.1.6. A stronger system for compliance monitoring and enforcement of multi-stakeholder land use planning and management systems is available to relevant authorities and provincial governments.

? Output 3.1.1. Effective results-based adaptive management and dissemination of results supported by participatory monitoring and evaluation system.

? Output 3.1.2. Knowledge and best practices emerging from the project effectively absorbed for use in gender responsive training of landowners and communities in local languages on SLM and SFM.

? Output 3.1.4. Landowners and communities benefit from gender responsive capacity building on SLM and SFM in local languages.

The project is also aligned with the GEF-7 Biodiversity Focal Area, Objective 1 ?Mainstream biodiversity across sectors as well as landscapes and seascapes Mainstream biodiversity across sectors as well as landscapes and seascapes? and more specifically with Focal Area element BD-1-3 ?Mainstream biodiversity across sectors as well as landscapes and seascapes through Natural Capital Assessment and Accounting?. All three project Components will produce outputs relevant to Natural Capital Assessment. Under Component 1, multi-agency processes for SEA, EIA and NCA and comprehensive land use plans integrating NCA, and SLM and SFM principles will be developed for mountain landscapes to strengthen coordination towards LDN and biodiversity conservation. NCA reports will be produced for mountain landscapes showing the value of biodiversity and its ecosystem goods and services and comprehensive land-use plans. Under Component 3, small and medium-sized enterprises will benefit from training on integrating the NCA approach and SLM principles into

feasibility plans and business models. Reports, results, and best practices will be shared through a national database. The Project will specifically deliver:

? Output 1.1.2. Stakeholders can access environmental assessment processes to feed into land use planning.

? Output 1.1.3. Conservation and Environment Protection Authority and other relevant central and provincial government agencies benefit from gender-responsive capacity and knowhow development for environmental assessment, compliance monitoring, and enforcement.

? Output 1.1.4. Natural capital valuation reports with scenario analyses showing the value of biodiversity and its ecosystem goods and services in mountain landscapes are available to affected stakeholders.

? Output 2.1.4. Stakeholders can access a range of sustainable financing mechanisms for LDN to incentivize land restoration.

? Output 3.1.3. Small and medium sized enterprises reached by gender-responsive training, are able to integrate natural capital valuation and SLM principles into feasibility plans and business models.

The Project takes full account of the GEF-7 project development guidance related to the ongoing Coronavirus disease (COVID-19) pandemic by containing provisions to enhance the sustainability of results and resilience through i) integrated planning and institutional coordination, ii) focus on marginal and disadvantaged people, iii) enhancing capacities for remote project preparation and implementation, and iv) enhanced knowledge management. Additionally, the project strategy, including all Outputs listed above take guidance from and are compliant with the GEF Policy on Gender Equality.

5) incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF and co-financing

The summary of the Project's incremental cost reasoning is presented in the table below:

BASELINE	ALTERNATIVE	INCREMENT
(A)	(B)	(B) - (A)

BASELINE	ALTERNATIVE	INCREMENT
(A)	(B)	(B) - (A)
<p>? The enabling environment for SLM and SFM, along with respective capacities remain inadequate. Information on the true value of natural capital is unavailable and therefore not reflected in land use decisions. Sectoral barriers prevent integrated landscape management and environmental regulations are largely not monitored and weakly enforced.</p> <p>? Degradation of agricultural and forest land across the Highlands continues due to unsustainable land use practices and the lack of integrated management. Livelihood strategies are unsustainable, and women's land-based livelihood development opportunities are underutilized. The lack of capital prevents transition towards social and environmental sustainability.</p> <p>? Knowledge and best practices on SLM and SFM are of limited availability and remain restricted within sectoral silos. Environmental awareness and capacities on SLM and SFM among the population of the Highlands prevents upscaling towards LDN. Natural capital values are not considered in business planning and economic decision-making.</p>	<p>? The alternative scenario brought by the GEF intervention creates a comprehensive enabling environment for SLM and SFM, including through institutionalized cross-sectoral landscape management that integrates environmental assessment processes and the true value of natural capital. Environmental regulations are carefully monitored, and their compliance is enforced across agencies.</p> <p>? A cumulated 84,409 ha of degraded land across the Highlands are managed through SLM and SFM technologies. Land-based sustainable livelihoods of women are built. Economic hurdles to engage on SLM by SMEs are overcome through sustainable financing made available through biodiversity offsetting mechanisms funded by large industries.</p> <p>? Knowledge and best practices on SLM and SFM are identified and disseminated and awareness and capacities of local communities on the subject are built. Land-based SMEs and operate along business plans that rely on economic decisions reflecting the true value of natural capital, all of which allows upscaling towards LDN.</p>	<p>? Gaps in the enabling policy, legal, regulatory, and institutional environment will be filled enabling integrated landscape management and environmental assessment and natural capital assessment to allow the delivery of GEBs.</p> <p>? Viable SLM and SFM technologies will be put in place to restore the Highlands, and sustainable livelihoods, particularly of women, along with readily available landscape finance will reinforce sustainable landscape management and deliver GEBs.</p> <p>? Relevant knowledge on SLM, SFM, environmental assessment, and integrated landscape management will be synthesized and disseminated, and environmental awareness will be raised. Capacities of SMEs and on integrating natural capital values in business planning contribute to upscaling and to GEBs.</p>
BASELINE COST	ALTERNATIVE COST	INCREMENTAL COST
? TOTAL: US\$ 33,596,487	? GEF: US\$ 3,512,100 ? Co-financing: US\$ 19,599,991 ? Baseline: US\$ 33,596,487 ? TOTAL: US\$ 56,708,578	? GEF: US\$ 3,512,100 ? Co-finance: US\$ 19,599,991 ? TOTAL: US\$ 23,112,091

6) Global environmental benefits (GEFTF)

The PPG phase resulted in changes against the PIF targets in project contributions towards GEF Core Indicators. The proposed changes and their justifications are presented in the table below:

GEF Core Indicators and Sub-indicators		Expected at PIF	Expected at CEO ER	Justification for change
3	Area of land restored (Hectares)	50,000	39,667	See explanations below.
3.1	Area of degraded agricultural land restored (hectares)	50,000	39,667	In order to maintain balance between various tribal communities in the two targeted districts, the number landscapes the project works on are fairly high, which substantially increases transaction costs. In addition, the unit costs of restoration of agricultural land (including terracing, establishment of erosion control measures, demonstration of sustainable agricultural practices) in the difficult terrain in the PNG Highlands are very high. Cost estimates obtained from NARI for the various activities clearly show that the available project budget, including the secured cofinancing may be insufficient to meet the initial targets defined in the PIF.
4	Area of landscapes under improved practices (excluding protected areas) (hectares)	50,000	44,742	See explanations below.
4.1	Area of landscapes under improved management to benefit biodiversity (hectares)	25,000	23,214	The reduction of is a modest 7.6%, resulting from mapping individual landscapes destined for community-based forest management together with local community and NGO representatives, as well as the local experience-based budget and work estimates of WCS, who will oversee the implementation of this activity.
4.3	Area of landscapes under sustainable land management in production systems (hectares)	25,000	21,528	In order to maintain balance between various tribal communities in the two targeted districts, the number landscapes the project works on are fairly high, which substantially increases transaction costs. In addition, the unit costs of establishing agroforestry systems obtained from NARI are high and the financial resources available to the project are likely insufficient to meet the PIF targets. Nevertheless, we strived to maximize the targeted area and propose a comparatively minor reduction by 13.9%.

6	Greenhouse Gas Emissions Mitigated (metric tons of CO ₂ e)	5,861,698	7,024,789	See explanations below.
	CO ₂ e Direct	733,333	7,024,789	The mapping of project landscapes by land-based intervention type allowed precise estimates of the targeted GHG emission mitigation by the Project, as transparently documented in the annexed FAO-ExAct tool (UNEP ProDoc Appendix 24) and the explanatory notes on the calculations (UNEP ProDoc Appendix 17).
	CO ₂ e Indirect	5,128,365		Due to lack of data on the indirect GHG emissions mitigated due to the removal of barriers, no realistic indirect GHG emissions could be calculated.
6.1	Carbon sequestered or emissions avoided in the AFOLU sector	5,861,698	7,024,789	See explanations above.
	CO ₂ e Direct	733,333	7,024,789	See explanations above.
	CO ₂ e Indirect	5,128,365		See explanations above.
	Anticipated start of accounting (year)	2022	2023	The COVID-19 caused delay of the PPG phase will lead to a delayed project start and thus of the accounting period.
	Duration of accounting (years)	20	20	-
11	Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment	50,000	22,000	More accurate beneficiary figures as compared to the PIF were obtained relying on 1) the PNG Census 2011 data, 2) accurate mapping of polygons of targeted landscapes, and 3) realistic estimates of targeted beneficiaries through discussions with local community and NGO representatives.
	Female	25,000	12,000	A number of project activities disproportionately favour the engagement of women (e.g. micro-credit, female-owned SMEs, capacity development programmes, etc.), therefore the proportion of targeted female beneficiaries was increased from 50% to 54.5%.
	Male	25,000	10,000	See explanations above.

Global Environmental Benefits (GEBs) delivered by the Project through GEF funding under the Land Degradation Focal Area include i) the improved provision of agro-ecosystem and forest ecosystem goods and services, directly on restored land (Logframe Indicator 2: ?Area of degraded agricultural land restored? with a targeted 39,667-hectare contribution to GEF Core Indicator 3.1) and indirectly across entire Hela and Southern Highlands Provinces under the implications of the land use plans to be prepared by the Project (Logframe Indicator 1 ?Contribution to national LDN targets: 1.a % of national SLM target & 1.b % of national rehabilitation target met?), ii) mitigated/avoided greenhouse gas

emissions and increased carbon sequestration in production landscapes, resulting from restoration, conservation and improved management of land and vegetation (Logframe Indicator 4: ?Carbon sequestration benefits attributed to the Project? with a 7,024,789 tCO₂e contribution to GEF Core Indicator 6.1 over a 20-year accounting period considering permanence; refer to **Appendix 19** and the separately attached FAO-Ex-Act tool), and iii) conservation and sustainable use of biodiversity in productive landscapes, resulting from agroforestry and restoration and sustainable use of remnant degraded forests (Logframe Indicator 13: ?Area of landscapes under improved management to benefit biodiversity? with a targeted 44,472-hectare contribution to GEF Core Indicator 4). In terms of improved provision of ecosystem services, specific benefits will include improved watershed services of restored forests and improved land productivity resulting in increased production of horticultural, agricultural, and NTFP produce. Additionally, restored sites will lead to improved regulation of climate and zoonotic diseases and contribute to the increased appreciation of sites of cultural significance across the Highlands. Restoration and rehabilitation of agricultural land and secondary forests, along with conservation of remnant forests will lead to carbon sequestration benefits amounting as described above. Conservation and sustainable use will safeguard key biodiversity assets in production landscapes, particularly in terms of threatened species. The Project will additionally contribute to the upscaling of Land Degradation Neutrality in PNG.

The Project will yield GEBs under the Biodiversity Focal Area in terms of iv) sustainable use of the components of globally significant biodiversity will be achieved through a) mainstreaming biodiversity conservation through Natural Capital Accounting into an enabling policy, legal, regulatory, and institutional framework (Logframe Indicator 1.1.1. Proportion of adopted policy, legal and regulatory instruments on land use planning that support an enabling environment for SLM, SFM and NCA?); b) enhanced capacities and implementation of compliance monitoring and enforcement of biodiversity relevant regulations including environmental assessments (Logframe Indicators 1.1.2. ?Number of people trained on environmental assessment processes disaggregated by sex?, and 1.1.4. ?Ratio of compliance with land use plan and integrated SEA & EIA provisions?); and c) restoration and sustainable management benefitting biodiversity of remnant forests (Indicator 3: ?Area of landscapes under improved management to benefit biodiversity? with a targeted 44,472-hectare contribution to GEF Core Indicator 4). The experience gained will also be valuable to other mega-diverse countries facing threats of biodiversity loss due to habitat degradation and destruction.

7) Innovativeness, sustainability and potential for scaling up

Innovativeness

The project is innovative in defining its landscape management interventions for biodiversity conservation and sustainable land management based on Papua New Guinea's LDN voluntary target setting programme. The Project is one of the first LDN transformative projects in PNG that directly addresses the implementation of the voluntary LDN targets. The Project's key technological and process innovations in terms of integrated landscape management include i) the integration of land use planning into existing institutions and processes, ii) the integration of environmental assessment, including of EIA, SEA and NCA into land use planning, and iii) the establishment of a platform of donor-funded projects focusing on integrated landscape management to exchange best practices and to achieve systemic change at the national policy and practice level. The project will assess the value of natural capital through established accounting tools, that form part of The Economics of Ecosystems and Biodiversity (TEEB) methodologies. Additionally, the Project will develop innovative SLM and SFM approaches (including the use of Conservation Deeds for community-based forest management in the Highlands) through a synthesis of traditional knowledge and science-based best practice and field test them through pioneering landowners, which will foster replication and upscaling. Finally, innovative sustainable financing mechanisms will be developed and tested, including biodiversity offsetting by large extractive industries, Payment for Ecosystem Services for carbon sequestration (voluntary REDD+), organic certification, microfinance, and others. The assumption is that these

efforts, combined with capacity building for these technologies and approaches, will generate the knowledge and institutional conditions to scale across temporal and spatial scales.

Sustainability

The Project's deliverables and achievements are expected to be sustainable, since the project design contains several elements that create permanent structures and processes that will be sustained beyond the Project's lifetime. The focus on creating an enabling policy, legal and regulatory framework (Output 1.1.1), government capacity development (Output 1.1.3), institutionalized cross-sectoral land use planning (Output 1.1.4), institutionalized environmental compliance monitoring and enforcement (Output 1.1.5), institutionalized community-based forest governance (Output 2.1.2), sustainable financing mechanisms including through micro-credit groups (Output 2.1.4), and the national best practice database on SLM and SFM (3.1.2) all foster long term structures in support of sustainability. In addition, the project will work closely and in full partnership with local communities and the SME sector, which will be reinforced and strengthened through an engagement with local land-based women's groups in terms of training for new approaches and managing competing land uses, creating a better climate for sustainability.

Risks to Sustainability

The likelihood of project results to endure beyond the Project's lifetime is subject to socio-economic, institutional and governance, financial and environmental risks. While socio-economic risks to sustainability are considerable, risks associated with other spheres are moderate. Existing risk levels during the PPG Phase translate to a moderately likely sustenance of project results overall.

Socio-economic risks to sustainability: The socio-economic sustainability of several project investments primarily hinges on the compatibility of these with the PNG Highland's land tenure situation and potential land use conflicts with large industries, as well as the securing of buy-in by local communities. The Project does not target to change land tenure, and its strategy strongly emphasizes on the tenure-responsiveness of all its investments to minimize associated sustainability risks. Land and resource tenure will be duly considered in all planning, consultations, and decisions with a potential impact on land use. FPIC procedures will be followed to ensure that stakeholders take well-informed decisions at the grassroots level. Social equity and gender responsiveness minimize social risks arising from marginalizing sections of society (refer to separately annexed **Appendix 22 Gender Analysis, Strategy and Action Plan**). Further socio-economic risks arise from potentially conflicting land use interests of large extractive and agro-industries and the small-scale management of SLM and SFM by local landowners. The Project will work along a multi-faceted strategy to minimize the risks by i) evidence-based policy advocacy, ii) broad-based environmental awareness raising, iii) obtaining formal Government commitments *a priori*, including on the enactment of relevant legislation, iv) capacity development, and v) showcasing the true value of natural capital, in order to safeguard biodiversity conservation and SLM priorities.

Institutional framework and governance risks to sustainability: The Project will create institutional frameworks (land use committees, community forest management groups) that focus on breaking sectoral silos and will draw membership from a broad stakeholder base. Strong emphasis will be put on their establishment and capacity development from project start to ensure that at project end institutions have fully taken charge of their mandates and can implement processes under their mandates. The Project was designed to close existing capacity gaps (refer to Project Document **Appendix 17**) to ensure the long-term sustainability of results. Empowered cross-sectoral institutions will thus reduce sustainability risks. Endurance of achievements in creating an enabling policy, legal and regulatory environment for land use planning integrating environmental assessment approaches is highly likely in case the concerned legislation can be enacted by Parliament within the Project's lifetime.

Financial risks to sustainability: the Project's substantial upfront investments to overcome barriers (enabling policy & governance framework; knowledge, technologies and capacities enabling SLM and SFM; establishment of sustainable financing mechanisms for SLM and SFM) will be financed from the GEF fund. Once in place, most of these investments will yield no or limited maintenance costs. The investments with substantial financing requirements beyond the Project's lifetime include: i)

biodiversity offsetting to be funded by large extractive industries, ii) costs of implementing land use plans, iii) costs of continued monitoring and enforcement of environmental offences. The costs associated with i) are primarily costs of advocacy among large private sector stakeholders on behalf of government staff. The costs associated with ii) are costs of government staff and transaction costs borne by local community representatives and other stakeholders. Government staff costs bear limited financial risks, whereas the interest-driven approach will minimize the risks of transaction costs associated with other actors. Monitoring frameworks and institutional arrangements will have been put in place using the GEF fund and therefore costs associated with iii) are primarily human resource related. It is anticipated that the reliance on well-trained staff on regular government payroll in combination with established remote sensing supported monitoring will ensure the sustainability of environmental monitoring activities. Lastly, it is expected that PNG will continue to receive assistance from the UNCCD in upscaling towards LDN, which will also contribute to the financial sustainability of the concerned investments.

Environmental risks to sustainability: The risks related to the environmental sustainability of project investments are low. The Project will primarily apply nature-based solutions for piloting SLM and SFM technologies, which represents the minimal risk approach.

Capacity Development for Sustainability

The Project will devote substantial emphasis to building local capacities in PNG to ensure the long-term sustainability of project results. The project strategy builds on a comprehensive capacity development strategy and plan, which was initiated during the PPG Phase by assessing stakeholder capacities and highlighting capacity gaps, along with key shortcomings in inter-institutional processes. The capacity development strategy and plan will further be updated, corroborated, and detailed during the Inception Phase, as well as annually thereafter (refer to Activity 1.1.3.1). The Project's capacity development approach will be holistic, targeting behaviour change, beyond merely imparting knowledge and developing skills. Behaviour change targeted for each specific stakeholder is documented in the separately provided Appendix 19 Stakeholder Engagement Plan. In terms of topics, capacities will be built on i) gender mainstreaming, ii) environmental monitoring, iii) compliance enforcement, iv) integrated landscape management, v) landscape restoration, vi) SLM and SFM technologies, vii) business planning integrating NCA, and viii) sustainable landscape finance. All capacity building efforts are covered through dedicated activities in the Project's activity plan.

Sustainability Strategy

The Project's sustainability strategy will focus on maximizing national ownership over project results across stakeholders by i) executing the Project through Partnerships, which ensure ownership and commitment towards individual project targets and achievements, ii) facilitating the commitment of financial resources by the Government of PNG, and other stakeholders to ensure the maintenance of human resources, institutions and processes put in place by the Project, iii) creation of institutions embedded into formal national frameworks, which carry key processes such as cross-sectoral integrated landscape management, and environmental monitoring and compliance, and iv) strong engagement of the private sector. The Project will establish new institutions enabled by adequate capacities and clear mandates of which they would have taken full control by the end of the Project. These include land use and community forest management committees, and microcredit groups. Further, the Project will engage private sector stakeholders into an institutionalized offsetting programme to ensure sustained finance to enable upscaling towards LDN. Finally, the Project will v) create a searchable national database for storing and publicly sharing datasets, best practices and lessons learnt to carry the Project's impact beyond its duration.

Potential for up-scaling

The Project will catalyse replication by Partners and stakeholders using a multi-pronged approach, which builds on i) developing a demonstration site showcasing best practices of restoration and SLM in theory (documentation & relevant publications) as well as practice (physical demonstration), ii) continuously identifying lessons learnt, iii) disseminating these lessons among stakeholders using multiple channels of communication and capacity development, iv) sustainable financing to trigger replication of SLM and SFM by landowners, v) the mainstreaming of the NCA approach in business

planning, and vi) capacity development to catalyse replication. The approaches, methods and tools targeted by the Project that have a high potential for replication in PNG include i) economically, ecologically, and socially viable SLM and SFM technologies (Outputs 2.1.1 and 2.1.2), ii), integrated landscape management approaches (Output 1.1.4), iii) the use of NCV for economic decision making on land and natural resources, iv) demonstration-based capacity development approach (Output 3.1.4), v) sustainable financing approaches based on biodiversity offsetting to facilitate engagement on SLM and SFM (Output 2.1.4).

The identification of lessons will be a continuous process accompanying project implementation. During the Annual Review and Planning Workshops, the PMU, Partners, and other stakeholders will review progress towards project targets in the logframe to identify i) lessons learnt in undertaking the project, along with ii) new technical approaches or designs that are worth replicating. The lessons identified will be presented in the PSC for approval to be formally documented by the PMU as a project lesson.

The Project's Partnership with SPREP opens a very important strategic pathway for replicating its results across the Southern Pacific region applying South-South and Triangular Cooperation. SPREP functions as the key regional knowledge hub on the environment and assists all member states in advancing towards environmental sustainability. The learnings of the Project will be internalized by SPREP as a Partner in its own knowledge management system and will allow easy replication in other related national contexts. The hosting of the national database of best practices on SLM, SFM and NCA on the PNG Environment Data Portal hosted by SPREP opens an important pathway of upscaling project results across the Pacific.

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1b. Project Map and Coordinates

Please provide geo-referenced information and map where the project interventions will take place.

Project interventions will take place in project landscapes across Hela and Southern Highlands Provinces, both located in the Highlands Region of Papua New Guinea within the geographic coordinates of 4°58'12" S to 6°51'39" S, and 142°3'58" E to 144°41'4" E. The location of Project intervention landscapes is presented by intervention type in the map in **Annex E**.

1c. Child Project?

If this is a child project under a program, describe how the components contribute to the overall program impact.

2. Stakeholders

Select the stakeholders that have participated in consultations during the project identification phase:

Civil Society Organizations Yes

Indigenous Peoples and Local Communities Yes

Private Sector Entities Yes

If none of the above, please explain why:

Please provide the Stakeholder Engagement Plan or equivalent assessment.

The Project's key stakeholders include Government of PNG organizations, with their respective administrative units at the national, provincial, and district levels; local communities, and local community organizations, including women's groups and youth groups; landowners; the private sector; Non-Government and Civil Society Organizations; academic organizations; and international development and environmental organizations, as presented in the table below. A more detailed stakeholder analysis is available in Appendix 19 Stakeholder Engagement Plan.

Stakeholder	Role in the Project
Government organizations	
Conservation & Environment Protection Authority (CEPA)	As GEF Operational Focal Point, CEPA ensures the alignment of GEF strategic areas and country priorities as well as performs overall coordination of GEF funded projects. CEPA will be the Executing Agency of the Project.
Papua New Guinea Forest Authority (PNGFA)	PNGFA promotes the management and wise utilization of the forest resources of the country as a renewable asset. PNGFA is well represented at provincial and district levels and contributes to the Project through data collection on forestry and land use change; compilation of activity data from forestry sector down to field level; disseminating guidelines and latest tools; building capacity of regional advisors and district staffs on improving data accuracy, archiving and documentation for national reporting.

Stakeholder	Role in the Project
Department of Agriculture and Livestock (DAL)	<p>The DAL is the lead government agency responsible for the management of the agriculture sector in PNG.</p> <p>DAL is well represented at the provincial and district levels and will contribute to the project by providing technical support for the implementation of SLM practices, facilitating outreach to farmers and landowners, and building capacity for knowledge management in agriculture. DAL will also contribute to the project by exchanging information on national agricultural development programs; compiling activity data from agriculture sector at district level; and disseminating guidelines and latest tools.</p>
Department of Lands and Physical Planning (DLPP)	<p>The Department of Lands and Physical Planning is the main department whose jurisdiction is the overseeing of land in Papua New Guinea. Its role and mission focusses on the ownership, allocation, and release of State and customary land for development purposes thus to alleviate poverty and improve the lives of people. This is contained in the Land Act 1996. DLPP will actively participate in shaping and implementing the land use planning processes, ensuring the plans reflect the interests of citizens and the country.</p>
Climate Change Development Authority (CCDA)	<p>The CCDA will participate in coordination among baseline projects, and use of data in the platform for Agriculture, Forestry and Other Land Use. CCDA has an online portal where data from oil palm, mining and settlements are included in an interactive map showing areas of concern.</p>
Department of National Planning and Monitoring (DNPM)	<p>The DNPM leads, plans, coordinates, and facilitates equitable and sustainable development of PNG, and will ensure that the Project is well embedded into the overall development planning and relevant policies.</p>
Department of Provincial and Local Level Government (DPLLG)	<p>The DPLLG will be engaged to shape the multi-hierarchy land use planning process. Besides, the DPLLG is an important partner in ensuring the linkage between national government policies and implementation on the ground in provinces, districts, local level government areas and wards.</p>
Hela Provincial Administration and Southern Highlands Provincial Administration	<p>The Provincial Administrations fulfil all government mandates at the provincial level and are responsible for implementing development activities. The Provincial Administrations will primarily be involved in the implementation of activities under Component 2 of the Project. At the same time, they will be beneficiaries of capacity development and knowledge management activities under Components 1 and 3 of the Project. The Provincial Land Use Boards will be established through the support of the Project.</p>
Department for Community Development and Religion (DCDR)	<p>The DCDR promotes and protects the rights of marginalized and vulnerable groups and will support the project in gender mainstreaming and social inclusion of field-based activities.</p>
Fresh Produce Development Agency (FPDA)	<p>The FPDA is a national government agency responsible for facilitating the development of the horticulture and fresh produce industry in PNG. From production to marketing, FPDA's primary function is to be a source of information relating to commercial horticultural activities across the country. The FPDA will be engaged through HRDF and DAL in the Project in women's livelihood development, the implementation of SLM technologies on farmland, and in developing land-based value chains.</p>

Stakeholder	Role in the Project
Academic organizations	
National Agriculture Research Institute (NARI)	NARI is the national authority on advancing agriculture through science and field testing. NARI will contribute to the Project by supporting the implementation of SLM practices in the project sites as well as relevant trainings for farmers and extension officers.
University of PNG (UPNG)	UPNG is the country's oldest university the produces most of the graduates active in the environment and land-based production sectors. UPNG will be engaged to provide capacity development and to integrate the Project's lessons into its revised diploma programme. UPNG will also be involved in delivering preparing the capacity development strategy of the project, delivering trainings on environmental assessment and land use planning processes, preparation of the Project's Climate and Disaster Risk Assessment, and trainings on improved lending practices incorporating NCA.
Consultative Implementation Monitoring Council under the PNG Institute of National Affairs	The Consultative Implementation and Monitoring Council (CIMC) is an independent organisation that brings together all civil society, the private sector and government partners to develop policy and directly influence and monitor government decision making for the long-term development of PNG. It was established by the National Executive Council. The goal of the CIMC is to ensure that dialogue, through the ongoing consultation processes, is sustained between government, private sector and the community at large and the recommendations made to government through this process are implemented. The CIMC will support Output 1.1.1 of the Project.
PNG-based NGOs and civil society organizations	
Binatang Research Centre (BRC)	Binatang Research Centre is the only conservation NGO in PNG that is very actively involved in research and is active in fundraising, has large biodiversity databases, actively involved in global research and networks, and therefore able to sustain itself. BRC already provides capacity building for CEPA, CCDA, PNGFA as well as provincial officers and will support the Project with the same, particularly on SFM. In addition, BRC will implement activities related to forest restoration. BRC will deliver project activities related to Natural Capital Assessment as well as trainings on SFM.
Hela Rural Development Foundation (HRDF)	HRDF is an important development partner dedicated to improving the lives of remote communities in Hela Province. HRDF will be engaged in the Project responsible for facilitating community entry, planning, and implementation of activities.
Private sector and interest groups	
ExxonMobil PNG	ExxonMobil PNG implements the PNG LNG Project that covers the entire Project area. This LNG project successfully implements a large biodiversity offsetting programme and will contribute to the Project by sharing lessons to be used in the sustainable financing mechanisms to be established through the Project.
Oil Search Ltd.	Oil Search Limited is the largest oil and gas exploration and development company in PNG, which operates all of the country's oilfields. It has a large stake in the PNG LNG Project operated by ExxonMobil PNG and has an ambitious corporate social responsibility programme that includes environmental offsetting and community development targets. The company will be engaged to channel Corporate Social Responsibility funds towards the establishment and implementation sustainable financing mechanisms (carbon offsetting) to be established through the Project.

Stakeholder	Role in the Project
Women's Micro Bank (MAMA Bank)	The Women's Micro Bank provides banking services to women and disadvantaged people in rural areas. The Bank specifically targets women owning informal businesses with savings and loan products. The Bank will be involved in the Project through HRDF in establishing micro-credit groups, and sustainable financing for SLM.
Centre for Excellence in Financial Inclusion	CEFI focuses on financial inclusion and literacy, poverty elimination and the promotion of vibrant financial institutional operation in Papua New Guinea. CEFI will be engaged through DCDR to provide trainings on financial literacy to Small and Medium Enterprises.
Mining companies, and coffee & cocoa industry	Large-sized enterprises will participate in dialogue and planning to develop and implement offset mechanisms, natural capital valuations, access to finance for small-scale investments in the value chain, etc.
Local community organizations, groups, and individuals	
Provincial Council of Women Hela and Southern Highlands	These organizations promote gender equality and empower women in socio-economic developments to alleviate poverty in the Southern Highlands and Hela Province. They support and promote economic livelihoods for women through agriculture and harness women engaged in farming and selling crops. They organize and carry out programs to promote and protect the interest of women in the Southern Highlands province, promoting women's entrepreneurship through agricultural and livestock activities, health care issues, training, and skills development. They will be engaged in Output 2.1.3 focusing on women's livelihood development.
PNG Women in Agriculture Development Foundation (Hela and Southern Highlands Provincial branches)	Women's groups play an active role in the Project by participating in capacity building, awareness raising, monitoring and evaluation, and facilitating the implementation of value chain development, women's livelihood development, and sustainable financing activities.
Women's and youth groups and associations	The capacities of women's and youth groups working on land and natural resources will be reinforced by the Project through trainings and by improving market accessibility. The Project will primarily work with these groups on the development of land-based value chains.
Non-state actors, including households and communities	97% of PNG's land is customary owned and engagement with the community is imperative when developing projects and infrastructure for country. Several of the proposed interventions will be community-based. The community and landowners will be active players in public awareness, training, and capacity development on sustainable land management and in up-scaling of SLM and SFM technologies.
Land-based small and medium enterprises	Informal land-based small enterprises make up most of PNG's businesses. The Project will work particularly with those owned by women on the implementation of value chain development, women's livelihood activities, and on sustainable financing. The SMEs will also be recipients of trainings on the integration of NCA in business planning in an effort to help their transition towards a green economy pathway.
International, intergovernmental, and bilateral development organizations	

Stakeholder	Role in the Project
Secretariat of the Pacific Regional Environment Programme (SPREP)	SPREP will be engaged to support the preparation of the SEA process and knowledge management.
UNEP	UNEP acts as the GEF Agency of the Project. UNEP will route GEF funds, provide supervision and technical backstopping, and will support international procurement, monitoring, and evaluation.
GEF	GEF is the main funding agency of the Project. GEF will review progress towards results and release fund disbursements to UNEP.
Wildlife Conservation Society	The WCS is very active in PNG and primarily works on the establishment of community deeds to conserve community-owned forests and on livelihood development activities, both of which simultaneously target gender mainstreaming. The WCS will be involved in the Project in the implementation of field activities under Component 2 in close collaboration with BRC.

In addition, provide a summary on how stakeholders will be consulted in project execution, the means and timing of engagement, how information will be disseminated, and an explanation of any resource requirements throughout the project/program cycle to ensure proper and meaningful stakeholder engagement

Stakeholder engagement during the PPG phase

Stakeholder engagement activities that were conducted during the conceptualization and PPG Phases are listed in the table below:

Date	Stakeholder consulted	Key points discussed	Documentation & reporting
2021.04.23	CEPA ? Carmel Jonduo ? Senior Policy Officer	? Introduction ? Discussion on possible change of targeted provinces	Stakeholder consultation minutes of meetings
2021.04. - 09	CEPA ? Carmel Jonduo ? Senior Policy Officer ? Maino Vaibo ? Directory Policy	? All aspects of PPG	Project Documentation
2021.05.11	PNGFA ? Margaret Tongo ? Elisabeth Kaidong	? PNGFA baseline ? Capacity needs ? Concerns about stakeholder fatigue from extensive consultations	Stakeholder consultation minutes of meetings
2021.05.12	CCDA ? Manau Renagi- Adaptation ? Rose Godana- Adaptation ? Paul Hasagama FAO CBIT Project	? CCDA baseline ? Capacity needs ? Gender mainstreaming opportunities ? NDC Implementation Plan	Stakeholder consultation minutes of meetings

2021.05.12	CEPA ? Malcolm Keako ? Tau Vogata ? Alu Kaiye	? CEPA baseline ? Proposals for project activities ? Protected Areas	Stakeholder consultation minutes of meetings
2021.05.12	DLPP ? Gibson Pitz ? Physical Planning Division	? DLPP baseline ? Capacity gaps ? Priorities for project activities	Stakeholder consultation minutes of meetings
2021.05.13	DPLLG ? Jennifer Adema ? Director District Capacity ? Lawrence Awak - Capacity Development Coordinator ? Philemon Nangu ? Performance Monitoring ? Jairah Wokasup - Capacity Development Coordinator	? Potential areas of collaboration ? Facilitation of linkages to provincial administrations ? Capacity needs ? Proposals for project activities	Stakeholder consultation minutes of meetings
2021.05.14	FAO-GEF Project ? Graham Kaina	? Status of PPG ? Areas of collaboration / coordination ? Baseline data	Stakeholder consultation minutes of meetings
2021.05.17	DAL ? Roger Suat (GIS Specialist)	? Organizational structure of DAL ? Gender mainstreaming activities ? Spatial information baseline	Stakeholder consultation minutes of meetings
2021.05.17	DAL ? IFAD Project: Market for Village Farmers	? Project status and activities ? Potential for collaboration	Stakeholder consultation minutes of meetings
2021.05.31	Hela Rural Development Foundation ? Takili Muk ? Board Member	? HDF overview ? Potential project sites ? Areas of collaboration: community facilitation	Stakeholder consultation minutes of meetings
2021.06.02	ExxonMobil ? Debbie Maraki - Community Investment Manager	? Baseline of EM community development programme in Hela & SHP ? UN collaboration ? Cofinancing opportunities	Stakeholder consultation minutes of meetings
2021.06.11	ExxonMobil Biodiversity Team ? Banak Gamui ? Biodiversity Supervisor (EMPNG) ? Julia Hagara ? Biodiversity Lead ? Anita Mosby - Socio-Economic Advisor ? Kalyna Taule - Biodiversity Advisor	? EMPNG baseline ? Potential areas of collaboration ? Participation in PPG	Stakeholder consultation minutes of meetings

2021.07.07	PPG Inception Workshop ? 28 participants from CEPA, DAL, PNGFA, HRDF, DPLLG, DLPP, DoCDR, CCDA, SHPA, HPA, CIMC, FAO, ExxonMobil, NARI, Binatang Research Centre, UNEP	? PPG phase overview ? GEF introduction ? PPG workplan ? Baseline, incremental reasoning and GEBs ? Project Outputs ? Site selection criteria	PPG Inception Workshop Report
2021.07.12	Hela Rural Development Foundation ? Takili Muk ? Board Member	? Provincial field visit logistics ? Provincial Inception Workshops ? Potential project sites	Stakeholder consultation minutes of meetings
2021.07.13	Department of Community Development and Religion ? Kami Kulumbu ? Community Capacity Enhancement Initiative ? Imma Samson- Social Impact Assessments and Community Disaster Response ? Betty Alupian Community Capacity Enhancement Initiative ? Andrew Kedukwakwa- Acting Assistant Secretary Community Development and Environment Branch	? DoDCR community training facilities and initiatives ? Financial literacy baseline ? SIA process conducted by DoDCR ? DoDCR legal baseline	Stakeholder consultation minutes of meetings
2021.07.18 ? 24	1st round of field visits ? Provincial authorities ? Local communities ? HRDF ? Small and medium enterprises ? Women?s associations ? Landowners and farmers ? Provincial DAL, PNGFA, etc. officers	? Site selection ? Beneficiaries ? Project activity plans ? Safeguards & gender ? Partnerships	Draft site selection report
2021.07.29	Binatang Research Centre Vojtech Novotny ? Director	? Potential areas of collaboration / partnership	Stakeholder consultation minutes of meetings
2021.07.29	Wildlife Conservation Society ? Adrian Tejedor ? Country Director ? John Kuange ? Assistant Country Director	? Potential areas of collaboration / partnership	Stakeholder consultation minutes of meetings
2021.08.06	Hela Rural Development Foundation ? Taliki Muk ? Board Member	? Potential partnership ? Site selection confirmation	Stakeholder consultation minutes of meetings
2021.08.11	University of PNG, GIS Unit ? Regina Kiele	? Mapping support to the Project	Stakeholder consultation minutes of meetings

2021.08.13	FAO Project Tari ? Amos Libe	? Optimal project setup in provinces	Stakeholder consultation minutes of meetings
2021.08.17	FAO-GEF 10515 ? William Jackson	? Coordination between PPG phases and projects	Stakeholder consultation minutes of meetings
2021.09.06 ? 09.11	2nd round of field visits to Hela and SHP ? Provincial authorities ? Local communities ? HRDF ? Small and medium enterprises ? Women?s associations ? Landowners and farmers ? Provincial DAL, PNGFA, etc. officers	? Site description ? Beneficiaries ? Project activity plans ? Safeguards & gender ? Partnerships	Final site selection report
2021.09.07	UNDP-GEF 10239 ? Philip Summers	? Coordination between PPG phases and projects	Stakeholder consultation minutes of meetings
2021.09.08-22	UNDP-GEF 9536 ? Andrew Rylance	? Coordination between GEF projects	Stakeholder consultation minutes of meetings
2021.09-13-22	PNGFA ? Margaret Tonguo	? Partnership agreement with PNGFA	Stakeholder consultation minutes of meetings
2021.09.16	Oil Search Ltd. ? Scott Crabtree ? Charlotte Moore	? Oil Search contribution to the Project	Stakeholder consultation minutes of meetings
2021.09.21	Binatang Research Centre ? Vojtech Novotny	? Partnership agreement on project implementation	Stakeholder consultation minutes of meetings
2021.09.23	Validation workshop	? Validation of project design	Validation workshop report
2021.09.27	University of PNG ? Prof Simon Saulei ? Prof Graham Sem	? Partnership agreement on project implementation	Stakeholder consultation minutes of meetings

Stakeholder engagement during project implementation

Project partnership arrangements: The Project will apply UNEP procedures for engaging partners into project implementation. The UNEP Partnership Policy defines specific due diligence procedures to be followed based on the type of partners and fund flow directions to ensure the performance capacity and reputation of implementing partners.

With the private sector, the means of engagement will range from signing MoUs to various legal instruments, which include Project Cooperation Agreements, Small Scale Funding and Donor Agreements to be defined according to the category of partnership, which includes i) Implementation Partner, ii) Financing Partner, iii) Platform Membership.

Project Steering Committee meetings: Project Steering Committee meetings will be held bi-annually, with one meeting immediately following the Annual Work Plan and Budget meeting, whereas the other held at a six-month gap. The Project Steering Committee will be convened by the NPD and its membership will consist of representatives of all key project stakeholders. The PSC meetings will include special mechanisms to review and address the concerns of local community members, and particularly of disadvantaged groups. The PSC will review and monitor the implementation of the grievance mechanism as outlined in Section 8.

Technical Advisory Committee (TAC) meetings: The TAC will meet quarterly and will consist of technical experts from implementing partners. It will convene following approval of annual workplans and review and provide guidance to the detailed technical design of project components.

Annual Work and Budget Planning workshops: All stakeholders will be invited to participate in the Annual Work and Budget Planning workshops. These workshops will also serve the review of progress achieved in the preceding year, incl. the identification of causes for potential delays. These workshops will contain special provisions to provide an opportunity for project beneficiaries to present their views and voice their priorities. Provisions will also be made that implementers/government agencies cannot dismiss local priorities unless these do not conform to the provisions of the Project document. The reports of these workshops will be circulated to all stakeholders.

Focus Group Discussions (FGDs): FGDs will take place to engage with local community members in a structured manner. FGDs will be applied to scope local priorities for the detailed design of project activities, for collecting relevant background information and for initial engagements on certain topics that are new to the concerned community. Separate FGDs will be administered to female and male members by a same-sex-group facilitator.

Ward-level Consultative Forum: Ward-level fora will be useful for bringing together village community stakeholders for public discussions on issues directly related to the Project, awareness raising, dissemination of project-related information or technical contents, and for discussing project progress in the concerned community, along with the challenges faced. The meetings will i) review the progress of project implementation against the local workplan for the concerned period, ii) define new targets for the upcoming planning period, incl. the selection of beneficiaries of project activities, iii) review challenges and constraints of implementation, and iv) receive and register any potential grievances or comments. Ward-level Fora will be conducted at least annually for progress review and planning purposes and in addition as required. The mandatory Ward-level Consultative Forum meeting will take place ahead of Annual Review and Work Plan Meetings and will inform these meetings. Attendance registers and minutes of these meeting must be maintained and shared with the PMU.

Workshops: The Project will organize targeted workshops to engage primarily non-community stakeholders. Workshops may be applied to elucidate stakeholder inputs into the design of certain project activities (e.g. defining priorities for the legal framework instruments targeted for revision through project support; design of the land use planning procedure to be applied by the project; design of sustainable financing mechanisms to be promoted by the project, etc.). In addition, workshops will also be used for a participatory review of project progress and for the definition of priorities for the upcoming Annual Workplan. Most workshops will be single-day events, however in some cases they may stretch over two days. Reporting on workshops will be mandatory and the duty of the workshop's lead facilitator supported by the Project's Communications and Knowledge Management Associate. Special provisions to facilitate the genuine participation of disadvantaged groups will be enforced.

Standing committees established by the Project: The Project will establish cross-sectoral standing committees consisting of all key stakeholders, including women and members of disadvantaged groups for the purpose of land use planning. Committees will be established at the Ward, Local Level Government, District and Provincial levels. These Committees will take decisions on land use in a transparent, well-informed, and well-negotiated manner. The Project will facilitate the work of and decision-making by these Committees.

Participatory Rural Appraisal (PRA): The Project will apply Participatory Rural Appraisal (PRA) tools to solicit structured information, elucidate local community priorities, allow structured learning and communal decision-making on various project activities. The Project will rely on the services of local NGOs to facilitate engagement with local communities, including using PRA tools. Throughout the PRA, a key focus will be laid on overcoming power differences to achieve full and genuine participation of all local stakeholders.

Trainings: Trainings will focus both on the project's primary beneficiaries, as well as on the Project's implementers, incl. several government agencies. Trainings will build on best practices of adult education, rely on experiential learning and a strong interactive component through contribution of the rich experience of participants to theoretical learning contents. Where possible, classroom trainings

will include field practices. Trainings, incl. approaches and contents will be designed based on training needs assessments and be tailored to the specific demands of the target audiences. Special provisions will be made to ensure the full and genuine participation of disadvantaged groups. The Project's capacity building strategy will heavily build on the use of demonstration plots to provide trainings on SLM and SFM approaches, and technologies based on hands-on examples. To ensure efficiency in training, the Project will apply training of trainers to multiply the impact.

Awareness campaigns: The Project will rely on awareness campaigns on various project topics in the targeted communities. Awareness campaigns will apply multiple methods, incl. public rallies, competitions, plenary presentations, etc. These will be supported by the use of posters and by getting schools involved to multiply impact. Awareness campaigns will best be done by school/college students and local champions, who will be equipped with posters or other awareness material.

Environmental education campaigns: While awareness campaigns will target the overall population, environmental education campaigns will be targeted towards school students. Presentations to students with the help of posters will educate students and raise awareness among them. The more active students can be engaged into supporting awareness campaigns to multiply impact.

Participatory monitoring: The Project will engage local communities in tracking progress against project targets. Additionally, participatory monitoring will also be carried out by schools.

Surveys/questionnaires: The Project will apply surveys/questionnaires to track progress against certain indicators defined in the logframe. These surveys will be developed and administered in the most appropriate manner (e.g., paper-based survey, online survey, etc.).

Stakeholder engagement by project component

Following the Inception Phase, the Project Implementation Phase performs a continuous engagement of stakeholders throughout the project lifetime. Project implementation requires stakeholder engagement customized not only in terms of formats that are adequate to the specific needs to the concerned stakeholders, but also to the subject matter contents of individual project components.

Component 1: Stakeholders to be engaged in component 1 will be mostly government departments and agencies to assess how their policies and legislation will be able to incorporate aspects of the project and in doing so build up capacities. Natural capital valuation is a new concept that needs to be fully understood in the Papua New Guinean context. From the initial stakeholder discussions, the latter concept needs to be explained thoroughly so that the departments are fully in tuned with what the purpose of this this valuation and its connectivity to the country. At the same time, government agencies need to be engaged in cross-sectoral land use planning and compliance monitoring and enforcement.

Component 2: The same stakeholders in component 1 will be linked with the provincial and local level governments of Hela and Southern Highlands provinces to engage with local communities and particularly women on the implementation of SLM and SFM technologies, land-based value chains and sustainable financing mechanisms to enable LDN to incentivise land restoration.

Component 3: In component 3, the stakeholders within the government and private sector as well as development partners will be able to contribute to the up scaling of land use planning and ecosystem goods and services and LDN. Participatory monitoring and an effective evaluation system would need to be in place and developed although along existing pathways if these exist. Similar projects already occur within Papua New Guinea, and it would be sensible to compare the knowledge and best practices of gender responsiveness to the landowners and communities, particularly regarding dissemination into appropriate local languages. The small and medium sized enterprises incorporating gender responsiveness would be able to elaborate as they begin to expand into large sized enterprises.

Project Management related engagement: Stakeholder engagement related to project management will focus on i) project governance aspects, ii) work planning, iii) budgeting, iv) monitoring and evaluation, v) reporting, vi) establishment of partnerships, and vii) communication. The details of these stakeholder engagement activities are presented in Exhibit 11.

Timing of stakeholder engagement activities

The timing of stakeholder engagement activities is described in detail in the Stakeholder Engagement Plan.

Select what role civil society will play in the project:

Consulted only;

Member of Advisory Body; Contractor;

Co-financier;

Member of project steering committee or equivalent decision-making body; Yes

Executor or co-executor;

Other (Please explain) Yes

3. Gender Equality and Women's Empowerment

Provide the gender analysis or equivalent socio-economic assesment.

Demographic and social context: PNG experiences high population growth rate, that is coupled with low levels of literacy, a high dependency ratio, high unemployment rates and high costs of living, which further exacerbate inequality. Women face distinct health-related disadvantages that include a very high child mortality and maternal mortality rates, and a high incidence of communicable diseases, including of HIV/AIDS. Life expectancy for females at 65.8 years has only lately surpassed that of 63.3 years for males. The male population outweighs female population.

Adolescent birth rates have dropped markedly from 65 to 52.7%, but nevertheless remain at a high level. Obesity affects women disproportionately as compared to men. Domestic violence against women remains a serious concern. 58.9% of women reported to ever have experienced either sexual or physical violence. Polygyny is frequently practiced in PNG, particularly in the Highlands, where it can be observed in 28.6% of marriages. The practice of 'bride price' is widespread and contributes to male perceptions of owning women, which in turn contributes to domestic violence against women. The education gap between sexes remains notable. PNG is the only country in the Pacific region, in which boys have a higher enrolment ratio as compared to girls. At the same time, PNG is the country with the lowest enrolment in the regional overall. At the primary level, the enrolment ratio for boys is 53% against that of 47% for girls. The gap closes somewhat at the secondary level, with enrolment ratios of 24.6 against 23.6% for boys and girls, respectively. The explanatory factors for the education gap are mainly related to preference given to boys, girls' safety concerns, and girls' work contribution in their households particularly in care for younger siblings. The education gap between girls and boys remains disproportionately high in the Highlands. Across the entire population, the mean years of schooling are 4.0 years for females and 5.3 years for males.

Both Hela and Southern Highlands Provinces are considered remote and backwards by PNG standards, however Hela is more so. Hela broke away from Southern Highlands Province and government administration is not yet fully established. Hela continues to look towards Southern Highlands Province and Mendi as a place from which they expect support and by which they feel unjustly treated. Cultural context: PNG's society is one of the most diverse globally and consists of approximately 213 indigenous tribes that speak 836 indigenous languages. In rural areas, PNG's population is socially organized into clans living on communally owned land. Clans inhabit customary land, and tribal identities and practices remain fundamental to PNG's society. In PNG, social, economic and gender relations are deeply influenced by kinship. Sex, birth order and generation are the usual basis of kinship structure, but the principles vary greatly between cultures. In different places across PNG, both matrilineal and patrilineal lines of inheritance can be found. Patriarchal attitudes and deep-rooted perceptions on the roles, responsibilities and identities of females have shaped traditional norms and practices that include polygamy (primarily polygyny), bride price, association of women with witchcraft, 'good' woman stereotypes, the tradition of male leadership and decision-making, and the custom of including women as part of compensation payment. Culture and cultural norms are thus key

determinants of women's traditional knowledge, participation in land management, land-based economic activities, and the role they play in influencing decisions on land use. Hela is homogeneously populated by members of the Huli tribe. Mythology links them back to a single ancestor, who had four boys and girl, who ended up occupying different parts of Hela. Everyone in Hela traces back their ancestry eight generations and ultimately to the five sons and daughters of the common ancestor. This mix of real and mythological kinship results in very strong social links towards different groups that can be both positive and negative. Fighting between clans that maintain traditional animosity is very prevalent. The Southern Highlands Province has a very different ethnic setup as it is populated by highly diverse groups of different language backgrounds that include Yalibu-Pangia, Imbongu, Kagua-Erave, Kutubu, Mendi, and Munihi speakers.

Church-based community organization targeting women are substantially more visible and active in Hela, as compared to Southern Highlands Province. This partially stems from the fact that since Hela is a new province, government organizations are not as well established, and their mandates are partially filled by civil society organizations.

Economic opportunities: 87% of PNG's population resides in rural areas, and therefore rural, agriculture-based economic activities are of vital importance to the national economy. Women are particularly important in the agricultural work force: of the 71% of employment engaged in agriculture, slightly more than half comprises of women. PNG's economy, particularly in rural areas is dominated by small informal businesses active in the agricultural sector, which account for 80% of consumption and fixed investments, 95% of gross domestic savings, and more than 90% of employment. There has been, however, a gradual increase in micro-, small- and medium-scale business enterprises by indigenous people and women, both in rural and urban areas. Small and microenterprises also supply 70% of coffee, 65% of cocoa and copra, and 35% of palm oil production of PNG. While the labour force participation is almost equal between sexes, vast differences exist between participation in the formal and the informal sectors. Men are almost twice more likely to participate in the former, whereas women are three times more likely to participate in the latter. Men work disproportionately more in the cash-based sector, including on cash crops, whereas women engage predominantly in household activities and subsistence farming. As a result, women derive limited benefits from the formal economy as they are mainly engaged in small scale-scale informal businesses. This is also reflected in the GNI per capita, which in 2017 was US\$ 3,767 for females against US\$ 4,814 for males.

In terms of economic opportunities, women have limited ability to control business income, face exclusion from decision making, and violence directed against them. Women are further constrained by a legal framework that does not adequately protect their interests, particularly in relation to property rights and employment. Customary law, which frequently discriminates against women, is commonly applied. However, the emergence of Small and Medium Enterprises (SMEs) in PNG in the last 5 years has seen many women engaged in agriculture and informal sectors emerge as important contributors to the national economy. Through SME programmes, women have participated and benefitted from financial literacy and other capacity building programmes. Women have started to gain access to banking facilities and other business support programmes.

Both in Hela and Southern Highlands Province most women are engaged in the informal private sector in agriculture. In both provinces women engaging in marketing agricultural produce and markets for local crafts are dominated by female vendors. Women also commonly engage in pig husbandry particularly in Hela Province. This distinguishes Hela from Southern Highlands Province as this practice cannot be observed there.

Policy, legal and regulatory framework

PNG is a signatory to several international conventions and processes to advance gender equality, which include:

? Convention Against Elimination of All Forms of Discrimination Against Women (CEDAW; ratification 1995): The CEDAW spells out 16 areas in which women face discrimination and mandates parties to amend their laws to prevent discrimination, to develop gender policies and to establish institutions to implement them. PNG submitted its first, second and third combined reports with a delay of 15 years in 2010 and the CEDAW committee found serious shortages in addressing the Convention's targets. These were partially addressed in the National Policy for Women and Gender Equality 2011-2015 (see below); however certain concerns, including the lack of gender-relevant legislation remain.

? Beijing Platform for Action 1995: The Platform enhances the social, economic, and political empowerment of women, improves women's health, facilitates access to education, defined by time-specific targets for committing countries.

? Convention on the Rights of Persons with Disabilities (accession 2012)

? Revised Pacific Platform for Action on Advancement of Women and Gender Equality (2005-15): Derived from the global platform, the regional platform focuses on the same priorities plus agriculture in a regional context.

? Equal Remuneration Convention

? Discrimination (Employment and Occupation) Convention

Similarly, relevant Multilateral Environmental Agreements have gender-specific considerations:

? UNCCD Gender Action Plan

? UNCBD 2015-25 Gender Plan of Action

At the same time the policy framework contains relevant component, which include:

? Vision 2050:

o Contains seven development pillars all of which mainstream gender,

o Development Pillar 1 explicitly focuses on Human Capital Development, Gender, Youth, and People Empowerment.

? Papua New Guinea Strategic Development Plan 2010-2030:

o States that "all citizens, irrespective of gender, will have equal opportunity to participate in and benefit from the development of the country".

o Identifies five key gender indicators, including on i) gender empowerment targeting the Gender Development Index, ii) curbing of domestic violence against women and children, iii) female to male school enrolment ratio, iv) females in tertiary education, v) females in wage employment.

? Medium-Term Development Plan 2018-2022:

o Identifies gender as one of the major development challenges of PNG,

o Defines Key Result Area 3 as Sustainable Social Development and spells out gender considerations within.

? National Policy for Women and Gender Equality 2011-2015:

o Provides guidance to the development of laws, regulations, and procedures, provides guidance for gender mainstreaming of national programmes,

o Identifies priority action areas including i) gender-based violence, ii) health, iii) HIV/AIDS, iv) education and training, v) cultural norms and traditions, vi) women's economic empowerment, vii) fisheries, viii) decision-making, ix) political participation, x) agriculture (targeting extension services

for women, prioritizing the access of women to agricultural credit, agriculture capacity building), xi) environment (recognizing differential knowledge on, attachment to, and valuation of the environment between sexes, promoting programmes that recognize gender perspectives), and xii) market opportunities.

- o Identifies multiply disadvantaged groups within women as women with disabilities, elderly women and displaced women.

- ? National Population Policy 2000-2010: recognizes gender equality and equal opportunities for women,

- ? Integrated Community Development Policy 2007: enhance community access to learning and development, mainstreaming gender considerations,

- ? Gender Equity in Education Policy: promotes women's access to education and their participation in decision-making,

- ? Public Service Gender Equity and Social Inclusion (GESI) Policy 2013: The policy seeks to balance gender equality in public service employment and to address gender discrimination in the public sector.

- ? National Agriculture Development Policy 2001-2012 and Strategy and National Agriculture Development Plan 2007-2016: gender-specific achievements include the establishment of women's micro-credit networks, women's networks and gendered agricultural programmes,

- ? Law and Justice Sector Gender Strategy

- ? PNG National E-Agriculture Strategy 2017-2023: develop capacities of women and girls in the application of IC technology in the agriculture sector.

Besides the policy framework, the legal framework partially mainstreams gender, including:

- ? Constitution of the Independent State of Papua New Guinea

- o The National Goal and Directive Principle # 2 calls for equal opportunity to participate in development and in personal and community matters;

- o The National Goal and Directive Principle # 4 states that all citizens must ensure natural resources and environment is conserved and is sustainably used;

- o Section 55 Equality of Citizens stipulates that all citizens must be accorded the same treatment and should not be discriminated against on the basis of sex, religion, ethnicity, language etc.;

- o Constitutional Amendment No. 32 (Equality and Participation) Act 2011 reserves one seat per province for women, which means 22 seats in Parliament in total;

- o However, the constitution does not explicitly spell out equality between women and men.

- o The Constitution also confirms the validity of traditional law unless it is contrary to codified laws.

For this reason, items in traditional law including the system of 'bride price', polygamy and the declaration of witchcraft and sorcery are elevated to legal status.

- ? National Council of Women Incorporation Act 1979 incorporates the National Council of Women with one representative of each of the provincial women's councils with the objectives of i) mutual exchange among women's organizations in the country, ii) promoting exchange with regional and international organizations on matters related to women, iii) engage in community work, particularly targeting the promotion of women.

- ? Employment Act 1978: outlaws discrimination the basis of sex and provides for equal pay, but does not contain any provisions against sexual harassment at workplace.

- ? Marriage Act 1963; Matrimonial Cases Act 1963, and Wills and Probate Act 1966: recognize both formal and informal marriage, which open possibilities of unequal treatment of women's property

rights, as well as the practice of bride price and polygamy. Promote patrilineal inheritance of property whereby they discriminate against women's ownership rights.

Institutional framework and capacities on gender mainstreaming

The institutions mandated with advancing gender equality in PNG relevant for the Project include:

? Department for Community Development and Religion (DfCDR), with its subordinate Office of Development of Women are responsible for the implementation of national policies on Women and Gender Equality.

? National Council of Women sits within the department and is focused on awareness and capacity building to support women in politics and upper management capacities.

? The PNG Department of Agriculture and Livestock (DAL) has a dedicated unit focusing on promoting gender equality in agriculture, thus particularly targeting rural women, called Women in Agriculture Development Unit (WiADU), which focuses on advancing women's participation in agriculture;

? Department of Personnel Management (GESI branch), who carry out gender sensitization of government departments, support WiADU's provincial network with advice on gender issues,

? Under the Public Service GESI policy, provinces have started to assign a GESI officer in each of their divisions

? Each province has a Provincial Community Development Adviser with specific responsibilities to support gender programme activities of the concerned Provincial Government.

? Provincial Councils of Women in Hela and Southern Highlands Provinces: The Council in Southern Highlands Province is particularly active and successful as a result of the leadership of its Head.

? Resource Centre for Women Yalibu, Southern Highlands: conducts trainings in agriculture and food processing, demonstration through informative posters.

? Women's Refuge Centre Yalibu, Southern Highlands: demonstration garden for agricultural activities; open ground and stage for open air events; instructor for local vocational schools, running literacy programme.

? Local Level Governments: LLGs have mandatory female membership, in addition to the representative female member several LLGs have elected female members and some even have female presidents.

? District Administration: The district administration also has mandatory female membership, responsible for ensuring the mainstreaming of gender into the district's development agenda and for representing women in decision-making.

? Ward Development Committees: WDCs are the basis for all community-level planning and all of them have mandatory women's representatives to ensure that female voices are heard and that women take part in communal decision-making.

Project relevant gender knowledge and activity profile: Women are primarily engaged in agricultural and horticultural production, small livestock rearing, fishing, and gathering of NTFPs. Provide significant amount of labour in cash crops. They are also important in the labour force producing cash crops and in marketing surplus produce. On the other hand, men are mainly engaged in the clearing of land for agriculture, fishing, hunting, cash crop production, and house construction. Men are also responsible for religious and political affairs. In terms of engagement in private sector businesses, gender divisions are also distinct. Women primarily engage in running small retail stores, marketing of produce at local markets, food processing, artisanal manufacturing, cultivation of cash crops, and gathering of NTFPs and firewood. Women's dominance is particularly striking in the marketing of

produce as local market vendors. Men's engagement in businesses mainly clusters around engagement in passenger transport, production and sale of cash crops, construction, small-scale mining, and forestry, as well as long distance marketing of agricultural produce. However, large-scale cash crop operations such as palm oil primarily engage men only. Men are substantially more knowledgeable about biodiversity, as men more frequently move into the forest, whereas women tend to keep closer to their compounds. Men also spend a lot of time hunting and as forests have retreated, men frequently move into isolated places. Women on the other hand have more knowledge related to agrobiodiversity and agronomy in general. In Hela and Southern Highlands Provinces, gender-specific knowledge and activity profiles are fairly similar to other parts of the PNG Highlands. Men mainly engage in labour-intensive tasks related to agriculture that include tilling, land clearance for shifting cultivation, and soil mounding for growing crops on drained soil. Once agricultural fields are prepared, men focus more on hunting. In addition, they build houses, chop firewood, and erect fences around their houses. In addition, men in Hela engage in digging deep ditches around their compounds, which is a common practice there. Once men have prepared agricultural fields and shift their focus towards hunting, women take charge of agriculture and are specifically responsible for selecting and growing agricultural crops. Women additionally take care of all household activities and the responsibility of raising children. The sale agricultural products involves both men and women. In interventions with outsiders men are more visible than women and participate in communal decision making frequently on behalf of their families. Men also have much better education as compared to women. Though women may be less visible, they nevertheless exert a strong influence on communal decision-making through their husbands.

Access & control of land and natural resources: Land tenure systems determine who can use what resources for how long and under what conditions. PNG's land tenure system is customarily defined with respect to land and associated natural resources (water, trees, minerals, wildlife, etc.) and women may under circumstances retain some rights to their group's customary land even after moving to their husbands' families. However, for most part women's land ownership rights are markedly more limited than those of men. Although women generally have access to land, their management and ownership rights over it are more limited as compared to men, who benefit from traditional communal governance systems. Even if land ownership follows a matrilineal line of inheritance, male family members dominate decisions on behalf of female owners. In practice, women rarely hold unconstrained ownership over land and natural resources. Transition to cash crops, which usually are planted for longer periods marks the transition from communal to individual private ownership. Decisions on releasing land into individual private ownership are almost exclusively taken by men and the beneficiaries of such decisions are also almost exclusively men. Land tenure in the PNG Highlands, including Hela and Southern Highlands Provinces is very complex. Given that all tribes, clans, and communities are patriarchal, land tenure mainly falls under the domain of men and exclusion and alienation rights are almost exclusively under their control. However, women retain access, use and management rights to land by virtue of kinship: a woman may tend and harvest pandanus on her father's land even if she is married outside. The complexity is increased by frequent polygyny, where men can have up to eight wives, who can thus also claim land rights through their husbands. These rights related to kinship are even stronger in Hela, where people trace their ancestry back by eight generations and thereby maintain links to several groups and thus secure rights to several pieces of land. Access to land is limited to members of the respective community and clan and outsiders can have access only with male local hosts. Alienation rights are vaguely defined as land is mostly under

customary ownership and boundaries are often very fuzzy and defined by natural features. The sale of land is very restricted, as most of land belongs to tribe or clan and this frequently hinders development activities. A piece of land may be covered by different tenure regimes for different commodities and services. Hunting rights are more open to a wider group and less strictly defined. On the other hand, land used for cultivation is subject to stronger tenure arrangements and only certain people are allowed to till the land. Yet strong tenure arrangements exist in the case of permanent cultivation for cash crops, such as coffee. Given that crops are private, but grown on communal land, cash crop cultivation raises lot of tensions within families, and are an important root cause of internal tribal fights that lead to the devastation of plantations. Owners of cash crop plantations are mostly men, but at times women take over from deceased male relatives.

Participation and decision-making in environmental planning and governance at all levels

(a) Policy and government: Women are underrepresented in policy level decision-making. Until the 2016 elections, 2.7% of parliamentary seats were held by women, whereas this figure has been at 0% since then. Working towards the GESI policy targets of 30%, 25% of 76 000 public servants are female, but in executive positions, including departmental secretary or deputy secretary, female proportion drops to 12%. Around 8-10% of the magistrates of village courts are female. The representation of women in policy and government in Hela and Southern Highlands Provinces is better as compared to other parts of PNG. Several LLGs, particularly in Hela have female presidents and elected members of LLGs include females besides the mandatory female representatives.

(b) Community decision making: Traditional decision-making is dominated by men, who appear in public debates and are responsible for the external communication of negotiated decisions. Nevertheless, women actively contribute to decision-making although in a more subtle and less visible manner. They are frequently responsible for leading the discussions to identify what decision traditions would dictate in a given situation. Commonly, women do not attend community meetings or in case they do, they do not contribute to discussions. In most cases, meetings are dominated by men. The reasons for weaker female participation in communal decision-making lie in cultural norms, coupled with the disproportionately heavy workload of females that prevents them from attending meetings. Women are generally less visible in communal decision-making as compared to men. However, their voices and opinions substantially influence decision-making at the communal level through their husbands and sons. Women will not speak out in public, so that husbands are not ashamed about a break of cultural norms.

(c) Household-level decision making: Women have much more say at household level than at the community level. At community level women are supposed to be invisible, whereas they are very empowered at the household level.

(d) Private sector: In 2012 only two private sector corporate entities had women on their boards. Women are constrained in participating in decision-making in the mostly informal private sector businesses they engage in. In Hela Province, lot of women engage with oil and gas companies and gain employment in housekeeping, kitchens, and laundry. Through these cash employments women have become very independent and emancipated in this province. In addition, women are mainly employed in informal businesses in the agriculture sector.

Access to socio-economic benefits and services: Agricultural crops cultivated by women tend to fetch half the price as compared to those cultivated by men. This large discrepancy stems from the fact that women primarily cultivate food crops, whereas men mainly cultivate cash crops. In addition to that, women enjoy more limited access to skill training in agriculture, which limits their possibilities to

cultivate and market agricultural produce at prime prices. Access to extension or financial services are either absent or very difficult to access for women. Women have limited ability to access and control financial benefits arising from their engagement in informal businesses, since income from businesses is frequently regarded as communal income that is controlled by men. In Hela and Southern Highlands Provinces, women have ability to keep financial proceeds from the sale of agricultural produce. There are several programmes active in the provinces that target female empowerment and financial literacy. The spread of microfinance has enabled women to have increased access to banking. In addition, several organizations help to local women's organizations to register themselves as formal organization under the Societies Act, which in turn strengthens women's access to external support and recognition. Men in both provinces increasingly accept the fact that women should be productively engaged in the economy and that they should not have to depend on men.

Analysis of gender gaps:

The key gender gaps in PNG Highlands and particularly the two targeted provinces include:

- ? Discrimination of females in participating in decision-making on land and natural resources, particularly when these are directed towards income generating activities;
- ? Very limited to no capacities to mainstream gender into land-based sectors in the provinces of Hela and Southern Highlands coupled with constrained capacities at the level of key federal government organizations. The only organization of remarkable capacity, though under constrained staff strength is the Department of Community Development and Religion.
- ? Improving, but still unequal economic opportunities for women in land-based sectors, which is coupled with an unequal distribution of benefits between sexes derived from land use.
- ? Unequal control of land and natural resources: women are discriminated against in terms of land ownership and other tenure rights.
- ? Differences in level of literacy that prevents women from accessing benefits, participating in decision-making, etc. Women have been disadvantaged in equal access to education and Hela Province is worse off because it has been isolated for long time.

Project strategy to remove gender barriers: Relying on the results of the Gender Analysis, the Project identified several strategic approaches to mainstream gender equality. These include provisions focusing on:

- i. Enhancing the Project's capacities on gender mainstreaming
- ii. Advancing women's participation in decision making
- iii. Safeguarding and expanding women's rights to access and control land and natural resources
- iv. Enhancing women's benefits arising directly from the Project in terms of capacity building and financial incentives, as well as indirectly through the Project's impacts from sustainably managed restored land
- v. Special provisions to enhance social equity in general to strengthen the resilience of vulnerable and disadvantaged groups against the COVID-19 pandemic's impacts.

In terms of i), the Project will rely on a partnership with the Department of Community Development and Religion (DCDR), which will contribute the services of a Gender Expert to conduct a comprehensive training on gender mainstreaming to the PMU staff and for implementing partners. In addition, the Project will identify a Gender Focal Point (GFP), who will be responsible to follow-up on the implementation of the present Gender Strategy and Action Plan. The GFP will receive continuous support from the DCDR Gender Expert in the implementation of this task. In addition, as far as

possible, the Project will strive to achieve a gender balance among its staff and consultants. In terms of ii) and iii) the Project will emphasize on gender-responsive consultations, which remove participation barriers for women. These will include sex-disaggregated meetings and Focus Group Discussions, women-only consensus building meetings prior to decision-making events to ensure women defend a strong common position, the employment of female facilitators, and the introduction of female quota on decision-making bodies. In terms of iv), the Project will maintain a gender balance among the Project's beneficiaries and introduce SLM and SFM technologies, land-based value chain development as well as financial support mechanisms that are prioritized by women and are intended to primarily benefit women. Targeted interventions will be assessed for their differential gender impacts. Additionally, the Project logframe contains sex-disaggregated and gender-responsive indicators and the Project will monitor gender relevant and gender explicit data. Specific strategies are spelled out in more detail in subsequent sections.

Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment?

Yes

Closing gender gaps in access to and control over natural resources; Yes

Improving women's participation and decision making Yes

Generating socio-economic benefits or services or women Yes

Does the project's results framework or logical framework include gender-sensitive indicators?

Yes

4. Private sector engagement

Elaborate on the private sector's engagement in the project, if any.

In the alternative scenario, the private sector will benefit from a policy, legal and regulatory environment that enables the integration of NCA into land use decisions, readily available information and knowledge on NCA, a facilitatory approach followed by government agencies, financial incentive mechanisms and increased capacities to capitalize on NCA in business planning. This will lead to a paradigm shift in business planning integrating NCA and to the sourcing of products from SLM and SFM for sustainable value chains, which will thus become the new mainstream land-based business approach. In addition, the private sector will contribute to and benefit from sustainable financing mechanisms that promote green business approaches with positive contributions to biodiversity conservation and LDN.

An overview of the private sector entities engaged in the Project is presented according to the GEF Private Sector typology in the Table below.

Typology	Private sector stakeholders involved in the Project
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Privately owned companies	SMEs across the landscapes targeted by the Project engaged in producing and marketing agricultural and forest (including NTFP) produce, primarily those owned by women
Cooperatives	No agricultural or land-based cooperatives exist in the project landscapes; however their role is effectively filled by women's and youth groups and associations working on land and natural resources
Publicly listed companies	Oil Search Ltd.; ExxonMobil PNG; Women's Micro Bank Ltd.
Joint ventures and partnerships	None in the project landscapes
Sole traders, primary producers and artisans	Small-scale farmers
Government owned business enterprises and state-owned companies	Fresh Produce Development Agency

Key private sector stakeholders engaged in project implementation include agricultural Small and Medium Enterprises, primarily those owned by women; women's and youth groups working on land and natural resources, Oil Search Ltd., ExxonMobil PNG, Women's Micro Bank Ltd., small-scale farmers and the Fresh Produce Development Agency. Agricultural SMEs, primarily those owned by women as well as women's and youth groups working on land and natural resources active in the project landscapes will be key project beneficiaries. They will receive training in financial management and business planning, including on options to integrate natural capital into business plans. They will also receive support for the development of biodiversity-friendly value chains. Large corporations, such as Oil Search and ExxonMobil PNG will be engaged in purchasing Certified Emission Reductions generated through the Project's restoration interventions and in contributing biodiversity offsetting funds. The Women's Micro Bank will be engaged to administer biodiversity offsetting funds and to release them to SMEs on the condition of adopting SLM and SFM technologies. The Women's Micro Bank will also be engaged in establishing women's micro-finance groups. Small-scale farmers will be the main beneficiaries of land-based investments into SLM and SFM technologies as well as associated capacity development. They will also be the beneficiaries of financial incentives disbursed by the Project upon successful adoption of SLM and SFM technologies on their land.

The Project utilizes the following private sector entry points outlined in the GEF Private Sector Engagement Strategy:

- (a) Smallholders and Small and Medium Enterprises (SMEs) through value chain interventions: The Project contains a dedicated gender-responsive component for value chain development for smallholders and SMEs.
- (b) National level companies responsible for in-country partnerships, government relations and local financial relationships: Implementation of the Project's LDN sustainable financing pilots will be implemented with support of two large corporations and a private bank: Oil Search Ltd., ExxonMobil PNG and the Women's Micro Bank.

The project maximizes the opportunities to engage diverse types of private sector entities into project development and implementation. The private sector will primarily be engaged in the implementation by i) co-developing sustainable financing mechanisms for LDN (Output 2.1.4.1), ii) tapping private finance for biodiversity offsetting (Activity 2.1.4.2), iii) establishment and administering of micro-credit groups to support female-owned SMEs (Activities 2.1.4.3 and 2.1.4.4), iv) piloting subsidies, tax easements and permit fees for financing LDN (Activity 2.1.4.5), v) piloting of organic coffee

certification (Activity 2.1.4.6), vi) purchase of Certified Emission Reductions generated through the Project's restoration activities (Activity 2.1.4.7), and vii) piloting of sustainable land-based value chains (Activity 2.1.3.5).

The Project applies five of six modalities for private sector engagement advocated by the GEF:

Engagement modality	Project strategy
Knowledge and information sharing	The Project engages the private sector in the design of financial incentive mechanisms required to upscale towards LDN in the targeted provinces (Output 2.1.4). In addition, Project Component 3 on knowledge management will closely engage private sector entities. Private sector entities will be engaged in participatory monitoring under Output 3.1.1, in the collection and absorption of best practices emerging out of the Project under Output 3.1.2, and in informing the mode of integrating NCV into business planning on behalf of SMEs (Output 3.1.3).
Policy development	Private sector entities will be engaged in policy development as part of stakeholder consultations to review policies under Output 1.1.1.
Technical assistance	Oil Search Ltd., ExxonMobil PNG, and other stakeholders, including SMEs were actively involved in project development and will be involved in implementation.
Capacity development	The Project provides capacity development to the private sector in terms of i) environmental assessment processes (Activity 1.1.2.2); financial management skills and business plan preparation (Activity 3.1.3.1); integration of natural capital assessment into business planning (Activity 3.1.3.3); training for banks and financial institutions in improved lending practices that incorporate natural capital (Activity 3.1.3.4) Besides, capacities on SLM and SFM technologies will be built (Output 3.1.4).
Finance	Private financing in the form of biodiversity offset payments and the purchase of Certified Emission Reductions will form part of the sustainable financing mechanisms piloted by the Project. The private sector also provides cofinancing to the Project.
Industry leadership	The piloting of a biodiversity offsetting mechanism and of Payment for Ecosystem Services for emission reductions will apply the expertise and be implemented with the active involvement of large industries that have substantial experience and interest in these subjects.

5. Risks to Achieving Project Objectives

Elaborate on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, the proposed measures that address these risks at the time of project implementation.(table format acceptable):

Project management risks

The key project management risks are of social and political nature and are related to the potential of low buy-in by local community members into the project as well as issues related to land tenure and tribal conflicts in the landscapes targeted by the Project. At the same time, important risks of organizational, management and economic nature persist, which are related to the financial management capacities of the Executing Agency, the physical distance of the PMU to the Project's target landscapes, inefficient cross-sectoral coordination, COVID-19-related travel restrictions, and the failure of passing project-sponsored

legislation by parliament. In addition, vested political interests, insufficient female participation, climate change, limited public awareness, and the elite capture of benefits pose potential low, but not negligible project management risks.

Mitigating actions to counter all management risks are internalized in project design through their inclusion in the Project's activity plans, specific allocation of responsibilities and definition of timeframes in the workplan, and the allocation of dedicated resources in the Project budget. The management strategy addressing social risks builds on a step-by-step engagement with communities, followed by transparent participatory planning procedures, coupled with a strong grievance redress mechanism to address emerging conflicts early on. Organizational and management risks are mitigated by promoting cross-sectoral collaboration, including in a formalized manner. Political risks are mitigated by raising awareness of policy makers and through maintaining transparent processes of beneficiary selection. Economic risks are mitigated by a bundle of economic incentives made available through the Project, as well as by careful budgeting. For details of risks and mitigating actions, refer to the table below.

Risk Description / Analysis	Risk rating	Risk Management Strategy & Actions
<p>Incompatible capacity of CEPA in financial management and accountability and lack of physical presence in the target provinces necessary to execute the Project</p>	<p>High</p>	<p>Despite the not having a strong track of record in implementing such projects, CEPA was the chosen Executing Agency by the Government of PNG. CEPA will be adequately supported, and the project will thus build its capacity, that may well be beneficial for the future role of CEPA in implementing GEF projects.</p> <p>Strategy: Procuring the services of a part-time Chief Technical Advisor; strong capacity development and careful financial management, which will ensure that the periodic (quarterly) release of funds is subject to adequate spending, accounting, and reporting on previous spending. Implementation through local partners will help to overcome structural challenges.</p> <p>Actions: Activity 3.1.1.5: training on financial management and reporting according to UNEP-GEF standards, Activity 3.1.1.11: continuous review of the risk assessment ratings, annual UNEP oversight missions.</p>
<p>Targeted local communities do not buy into the Project due to lack of perceived short-term benefits</p>	<p>High</p>	<p>Strategy: Full FPIC process to be followed for community engagement, clarifying realistic expectations in terms of project benefits. Additionally, early scheduling of activities that yield direct benefits at community level.</p> <p>Actions: Activity 2.1.1.2: FPIC and beneficiary selection.</p>

Risk Description / Analysis	Risk rating	Risk Management Strategy & Actions
Contentious land tenure issues prevent, delay, or allow incomplete implementation of interventions, including land use planning, SLM and SFM interventions, etc.	High	<p>Strategy: Project follows full FPIC process in engaging with communities; interventions that potentially infringe on land tenure are designed and implemented in a tenure-responsive manner, accompanied by awareness raising and providing livelihood development and sustainable financing.</p> <p>Actions: Broad based participatory engagement of local stakeholders, specifically refer to Activity 2.1.1.2: Prioritize communities, engage with them, and plan local project activities considering full FPIC; Activity 1.1.4.1: Establish, capacitate, and ensure sustainability of Hela and Southern Highlands Provincial Land Use Boards and cross-sectoral district land use planning committees; Activity 2.1.2.1: Establish gender-responsive governance structure for community-based sustainable forest management.</p>
Tribal conflicts in the project area prevent effective and efficient project implementation	High	<p>Strategy: broad participatory stakeholder processes to design land-based interventions, livelihood development, facilitation of sustainable financing, and dedicated grievance redress mechanisms to avoid and manage potentially emerging conflicts</p> <p>Actions: Activity 3.1.1.11: as part of it, establish and quarterly monitor Project-level Grievance Redress Mechanism; Activity 2.1.1.2: Prioritize communities, engage with them, and plan local project activities considering full FPIC; Activity 2.1.3.4: Develop gender-sensitive livelihood improvement programme; Activity 2.1.4.4: Disburse sustainable financing to SMEs on the condition of contributing to upscaling towards LDN.</p>
Inefficient cross-sectoral coordination between government stakeholders	Medium	<p>Strategy: cross-sectoral & participatory project implementation, shared responsibility of project implementation by Partners</p> <p>Actions: Activity 1.1.4.1: Establish, capacitate, and ensure sustainability of cross-sectoral land use planning committees in Hela and Southern Highlands Provinces; Activity 1.1.5.2 Develop and implement cross-sectoral compliance monitoring and enforcement system.</p>

Risk Description / Analysis	Risk rating	Risk Management Strategy & Actions
Physical distance to PMU and no presence of CEPA in the targeted provinces prevents effective project implementation	Moderate	<p>Strategy: strong external support to PMU, including through Provincial Project Coordinators, Partners in Provinces & regular UNEP supervisory missions</p> <p>Actions: establish project execution structures in Provinces, ensure regular communication, intensive backup, refer to Activity 3.1.1.6: Conduct participatory process monitoring according to Annual Work Plans, the annual qualitative review of the work plan, including information on project progress, challenges, and knowledge needs, and participate in coordinated M&E.</p>
Conflict of interest between land restoration and the mining, oil palm sectors and other development initiatives	Moderate	<p>Strategy: Closely engage large land-based industries in project implementation, ensure that offsetting mechanisms to do not lead to restoration that increases conflict of interest.</p> <p>Actions: Activity 3.1.1.7: Hold at least two Project Steering Committee (PSC) meetings per year; Activity 3.1.1.11: Conduct annual implementation review of ? Stakeholder Engagement Plan, Project Communication Strategy and Action Plan, project management risks, social and environmental safeguards.</p>
COVID-19 impacts may lead to restricted travel of consultants and may hamper project implementation	Moderate	<p>Strategy: The Project has chosen a consultant allocation strategy that is fully responsive of COVID-19 related travel restrictions. Once the CTA can be deployed to PNG, activities can be started with remote support of international subject matter consultants.</p> <p>Actions: all activities.</p>
COVID-19 economic impacts on PNG lead to diminished contribution of cofinancing commitments	Moderate	<p>Strategy: PSC meetings will regularly review cofinancing contributions and identify priorities in case the government?s ability to contribute cofinancing diminish.</p> <p>Actions: Activity 3.1.1.9: to regularly review cofinancing contributions.</p>
Parliament does not pass legislation prepared by Project in a timely manner	Moderate	<p>Strategy: development of close partnerships with policymakers and legislators, effective policy advocacy</p> <p>Actions: Activity 3.1.2.3: Implement an information campaign among policy makers.</p>

Risk Description / Analysis	Risk rating	Risk Management Strategy & Actions
Political interests divert focus of project activities	Moderate	Strategy: Closely engage with policy makers so that they have clarity on the project's results framework and maintain streamlined, transparent participatory processes for the selection of sites, beneficiaries, and activities. Actions: Activity 2.1.1.2: Prioritize communities, engage with them, and plan local project activities considering full FPIC; Activity 3.1.2.3: Deliver community and public awareness campaigns.
Climate and disaster risks threaten the sustainability of project interventions	Moderate	Strategy: Mainstream climate change into project implementation. Action: Activity 2.1.1.1 Climate and Disaster Vulnerability Assessment to inform all relevant interventions of the Project.
Women do not effectively take part in project-related decision making	Moderate	Strategy: Enforce female quota and remove barriers for women's participation. Action: Activity 2.1.3.1 Gender Action Plan identifies in detail a large set of measures to overcome the barriers.
Limited public awareness results in limited community support for SLM and SFM activities	Low	Strategy: Well-designed and intensive advocacy and public awareness campaigns, along with promotion of change-makers and demonstration sites. Actions: Activity 3.1.2.3: Deliver community and public awareness campaigns.
Elite capture of project benefits	Low	Strategy: Careful identification of vulnerable and disadvantaged sections of society and tailor-made engagement; equitable beneficiary selection targeting women, vulnerable and disadvantaged Actions: Activity 2.1.1.2: Prioritize communities, engage with them, and plan local project activities considering full FPIC; Activity 3.1.1.11: Conduct annual implementation review of the Gender Analysis, Strategy & Action Plan; Stakeholder Engagement Plan; Project Communication Strategy and Action Plan and social and environmental safeguards.

Risks related to climate change

The following climate risk screening intends to ensure that the Project will be resilient to shocks, and that GEBs can be secured under projected climate change impacts. Expected and project shifts of various climate parameters as well as climate change related risks in PNG are summarized in **Section 1.a Project**

Description, 1) Global environmental problems, root causes and barriers. These observations and projections are implied from regional data and lack sufficient precision and secured local validity.

Predicted impacts on key sectors in the PNG Highlands are:

? Ecosystems: Ecosystems are expected to experience a loss of species diversity, altitudinal migration of species, fragmentation of species distributions, changes in species assemblages and the spread of invasive alien species.

? Agriculture: Agriculture is rainfed and therefore vulnerable to precipitation extremes. The projected increase in the occurrence of extreme events will lead to increased flooding and landslides that will lead to erosion and loss of agricultural land. Increased humidity will create favourable conditions for the spread of crop diseases and decrease yields. At the same time the increased frequency of droughts will also lead to decreased agricultural yields.[1]

? Water resources: PNG relies primarily on rich surface and to a subordinate extent on groundwater resources, which however are rapidly degraded due to extractive industries, population boom, and the expansion of agriculture and forestry. Increased temperatures and changing precipitation patterns will further exert pressure on water resources.[2]

? Livelihoods: decreased economic output primarily from agriculture leads to a loss of the livelihood base, that is further exacerbated by diminished food security.

Climate change relevant guidance for the Project: The Project takes guidance and is well aligned with PNG's climate change policy, legal and regulatory framework, that is presented in detail in the **UNEP-GEF Project Document Section 3.6**. The Project directly addresses the PNG National REDD+ Strategy 2017-2027 by strengthening national land use and development planning; improved environmental management, protection, and enforcement; and financing the reduction of emissions from the AFOLU sectors. The Project will directly contribute land use planning and piloting carbon forestry projects to support conservation and sustainable use of forests and thereby the achievement of LDN. The Project addresses priorities identified in the National Climate Compatible Development Policy 2016 by i) mainstreaming climate change into development-related processes, such as land use planning; ii) quantifying and prioritizing hazards through climate vulnerability assessments while planning for adaptation; iii) analysing potential costs and benefits of different adaptation options; iv) incentivizing investments into low-carbon development through piloting sustainable financing mechanisms for LDN; v) introducing vertically-integrated land use planning across different levels of public administration; vi) sourcing of funds towards activities that advance adaptation and mitigation.

The Project recognizes the risk climate change poses on project activities and the sustainability of Global Environmental Benefits to be generated through the Project, as summarized in Project Management Risk # 12 in the section above, as well as the moderate rating of Environmental and Social Safeguard Standard 2 ?Climate Change and Disaster Risks? described in **UNEP-GEF Project Document Section 3.11** and in **Appendix 15**.

A coarse Climate Risk Assessment and resulting mitigation measures are presented in the table below:

Risk	Rating	Mitigation Strategy
Insufficient knowledge of projected climate parameters and expected climate change impacts	Low	The Project will closely collaborate with CCDA to remain up to date on climate and disaster risk relevant information on the Project landscapes. In addition, the Climate and Disaster Vulnerability Assessment (Activity 2.1.1.1) at the start of project implementation will provide the climate change baseline.
Technical and institutional capacity and the information base are insufficient to increase resilience and to implement adaptation	Moderate	The Project will ensure that all capacity building mainstreams climate change through the appropriate recognition of projected changes in climate parameters, their impacts, as well as adaptation, and mitigation actions in various training contents. These include nature-based solutions for SLM and SFM to secure ecosystem services, deliver carbon sequestration, and support food security and livelihoods through climate-smart agriculture, and increased resilience of restored landscapes. Training contents will additionally deal with options to increase resilience and reduce vulnerability to climate change.
Climate sensitivity has not been adequately addressed	Moderate	Building on findings of the Climate and Disaster Vulnerability Assessment (Activity 2.1.1.1), and the application of nature-based solutions will maximize resilience, the Project recognizes constantly the changing sensitivity of ecosystems and the resulting severity of climate change impacts. The Project will explicitly consider the variability of climate projections and anticipated impacts in different scenario plans that inform land use plans (Activity 1.1.4.3). In addition, community-based forest management planning will ensure that sensitivity to climate change is adequately reflected in planned interventions.
Project outcomes are vulnerable to climate change	Low	A Climate Vulnerability Assessment (Activity 2.1.1.1) will provide an appropriate baseline to anticipate climate change impacts on project investments and design them in a manner to maximize resilience. The Project substantially contributes to the long-term climate resilience of the PNG Highlands through landscapes restored applying nature-based solutions, the conservation of biodiversity, and the reduction of threats from land degradation, thereby contributing to adaptation and sustainable livelihoods.
Resilience practices and measures are maladaptive	Low	Landscapes under degradation due to unsustainable land use and subject to biodiversity loss show increased vulnerability to the impacts of climate change. The Project will reduce these threats and increase resilience by delivering Outputs that are commensurate with predicted climate change impacts so that the GEBs can be sustained. A key objective is to restore landscapes and conserve biodiversity benefits for increased resilience.

[1] The World Bank, ?Vulnerability, Risk Reduction and Adaptation to Climate Change - Papua New Guinea? (Washington D.C., 2011), pp. 117?40 <<https://doi.org/10.1787/9789264098473-9-en>>.

[2] The World Bank.

6. Institutional Arrangement and Coordination

Describe the institutional arrangement for project implementation. Elaborate on the planned coordination with other relevant GEF-financed projects and other initiatives.

The project management structure is presented in the organogram in **Figure 2**.

GEF Agency: UNEP is the responsible GEF Agency that provides implementation oversight to the project on behalf of the GEF, assisting the Executing Agency (EA) in effective project delivery, and reporting on project progress to the GEF Secretariat. UNEP will be responsible for overall project supervision and oversight, ensuring consistency with GEF and UNEP standards, policies, and procedures, and maintaining accountability towards the GEF through standardized reporting. UNEP will also provide technical and administrative backstopping (including project appraisal and legal agreement, oversight of financial management), disburse GEF funds to the two Executing Agencies and review financial reports, will closely monitor project implementation (for example, through supervisory missions), ensure that strategic adaptive management is applied as needed, and will commission the mid-term and terminal evaluations. UNEP will ensure the maintenance of operational standards. As part of this, UNEP will provide project management training at the start of the project, including financial management and involving in recruitment process of key staff members. UNEP will have monthly execution meetings with EA and will also undertake mission to the PNG every six months to provide implementation oversight. UNEP will take part in strategic project management decisions through its membership on the Project Steering Committee. Furthermore, strategic decisions that may need approval from the GEF (e.g., major changes to the Project's logframe because of the Inception Phase or the Midterm Review, etc.) will be referred to the GEF by UNEP. UNEP will additionally ensure that the project is in line with the UNEP Medium-Term Strategy and Program of Work (PoW). UNEP will provide its project oversight services primarily through the UNEP Task Manager, Ecosystems Division, as the first reporting supervisor, who will be supported by the Programme Assistant, Ecosystems Division. Financial oversight will be provided by the Fund Management Officer, based in the Fund Management Office in Nairobi.

Executing Agency: The Conservation and Environment Protection Authority (CEPA) acts as the Project's Executing Agency (EA) and therefore has the overall responsibility to execute the Project under the oversight of UNEP and according to the provisions defined in the Project Document, as well as UNEP, GEF, and Government of PNG standards, policies, legislation, and procedures. The CEPA is responsible for the day-to-day management and administration of the Project, managing the delivery of project outputs, ensuring accountability for intended and appropriate use of funds, procurement, contracting, coordination with Project Partners, particularly other Government of PNG organizations, and coordination of the delivery of cofinancing by the Government of PNG. The CEPA will second the National Project Director to the Project and will establish the Project Management Unit (for details see below) for day-to-day implementation of project activities. Irrespective of the executing functions, the CEPA will also have the lead responsibility for the delivery of certain project activities that are within the core mandate of the CEPA (refer to Appendix 5 Workplan). The CEPA through the PMU enters into contractual arrangements with Project Partners for the implementation of certain project Activities and with Local Service Providers for the delivery of smaller distinct service packages related to project implementation (refer to Appendix 5 and Appendix 14).

For project management, the CEPA establishes the Project Management Unit (PMU) within its premises, charged with day-to-day project implementation. The PMU is supervised by the National Project Director (NPD), who is a senior officer of the CEPA seconded part-time to the Project. The PMU is staffed with the positions for National Project Manager (NPM), Administrative and Finance Assistant (AFA), Communication and Knowledge Management Associate (CKMA); 2 Provincial Project Coordinators (PPCs) attached with the Provincial Government of Hela and Southern Highlands Provinces.

Project Steering Committee (PSC): The PSC provides strategic guidance, policy-level decision-making, and strategic stakeholder coordination. The PSC will be chaired by the Managing Director, CEPA, who ex officio fills the function of GEF Operational Focal Point. The function of PSC Chair will be filled by the NPD, who will be responsible for convening PSC meetings and for preparing the agenda, while the NPM will act as Member Secretary and take the minutes and disseminate resolutions. PSC members will include the NPM; the NPD (in representation of the CEPA); representatives of the Binatang Research Centre

(BRC); Department of Agriculture and Livestock (DAL); Climate Change Development Authority (CCDA); Department of Lands and Physical Planning (DLPP); Department of Provincial and Local Level Government (DPLLG); the Department for Community Development and Religion (DCDR); Hela Provincial Administration; Southern Highlands Provincial Administration; Hela Rural Development Foundation (HRDF); National Agriculture Research Institute (NARI); PNG Forest Authority; Secretariat of the Pacific Regional Environmental Programme (SPREP); University of PNG; a representative of the GEF-10151 Project; UNEP and the Wildlife Conservation Society (WCS). The PSC will take policy-level decisions on project implementation, such as recommendations to UNEP on necessary strategic adaptations of the Project, and senior management decisions, including the approval of Annual Work Plans and Budgets and the approval of major project deliverables. The PSC will also provide strategic guidance, review the progress of project implementation, facilitate strategic coordination between stakeholders, and ensure the delivery of cofinancing. PSC decisions will be taken unanimously, or where not possible, by majority vote. In line with COVID-19-related restrictions, PSC meetings will allow virtual attendance, particularly for members stationed outside Port Moresby. PSC meetings will take place twice per year (once after the preparation of the Annual Work Plan and Budget ? to be approved by the PSC, and once with a six-month gap, coinciding with the submission of PIRs to the GEF Secretariat). The resolutions of PSC meetings will be circulated by the NPM, countersigned by the NPD, no later than two weeks following meetings.

Technical Advisory Committee: A large number of stakeholders were brought on board as partners to increase ownership, sustainability, and cost-effectiveness, necessitating the establishment of the Technical Advisory Committee (TAC) as a platform to ensure on-going smooth collaboration on technical matters across the high number of partners. The TAC will be constituted to provide technical oversight, guidance, and support to project implementation. The TAC will be chaired by the NPM, and its membership will consist of the CTA, as well as senior technical subject matter experts from each of the Project Partners, other key government departments and corporations, CSOs, donor organizations, and academia with thematic competence and/or authority relevant to the thematic subjects of the Project. The TAC is responsible for reviewing and providing recommendations to the PMU on all technical methodological processes developed and followed the Project, and on technical aspects of implementing activities. Additionally, the TAC is responsible for reviewing the technical quality of implemented activities. Technical guidance on project implementation (e.g., clearance of technical methodologies) is provided by the Technical Advisory Committee (TAC). TAC meetings will take place at least quarterly and will be facilitated by the CEPA through the PMU.

Partnerships: The Project will be implemented through Partnerships with key stakeholders including the Binatang Research Centre (BRC); Department of Agriculture and Livestock (DAL); Department of Community Development and Religion (DCDR); Department of Lands and Physical Planning (DLPP); District Development Authorities (DA); Hela Rural Development Foundation (HRDF); National Agriculture Research Institute (NARI); PNG Forest Authority (PNGFA); Secretariat of the Pacific Regional Environment Programme (SPREP); University of PNG (UPNG); and Wildlife Conservation Society (WCS). The contributions of further partners including the Fresh Produce Development Agency (FPDA), Centre for Excellence in Financial Inclusion (CEFI), Women's Micro Bank, and ExxonMobil PNG will be indirectly secured through HRDF. Partnerships will on one hand be instrumental in enhancing multi-stakeholder processes (e.g., land use planning, cross-sectoral environmental compliance monitoring and enforcement, the sustainable financing of SLM, etc.) through distributed leadership, and increase the ownership of multiple stakeholders over key processes and outputs. On the other hand, partnerships will serve the highly cost-effective securing of institutional capacities and knowledge that will be of crucial importance for the delivery of certain project results (e.g., community forest management planning by WCS, capacity building on SLM through NARI, capacity building on SFM through BRC, implementing SLM and value chain development through FPDA, gender expertise provided by DCDR, etc.). Knowledge transfer to National Partners from international Partners and Consultants will receive high emphasis to build local capacities. This knowledge transfer will be facilitated by the Chief Technical Advisor.

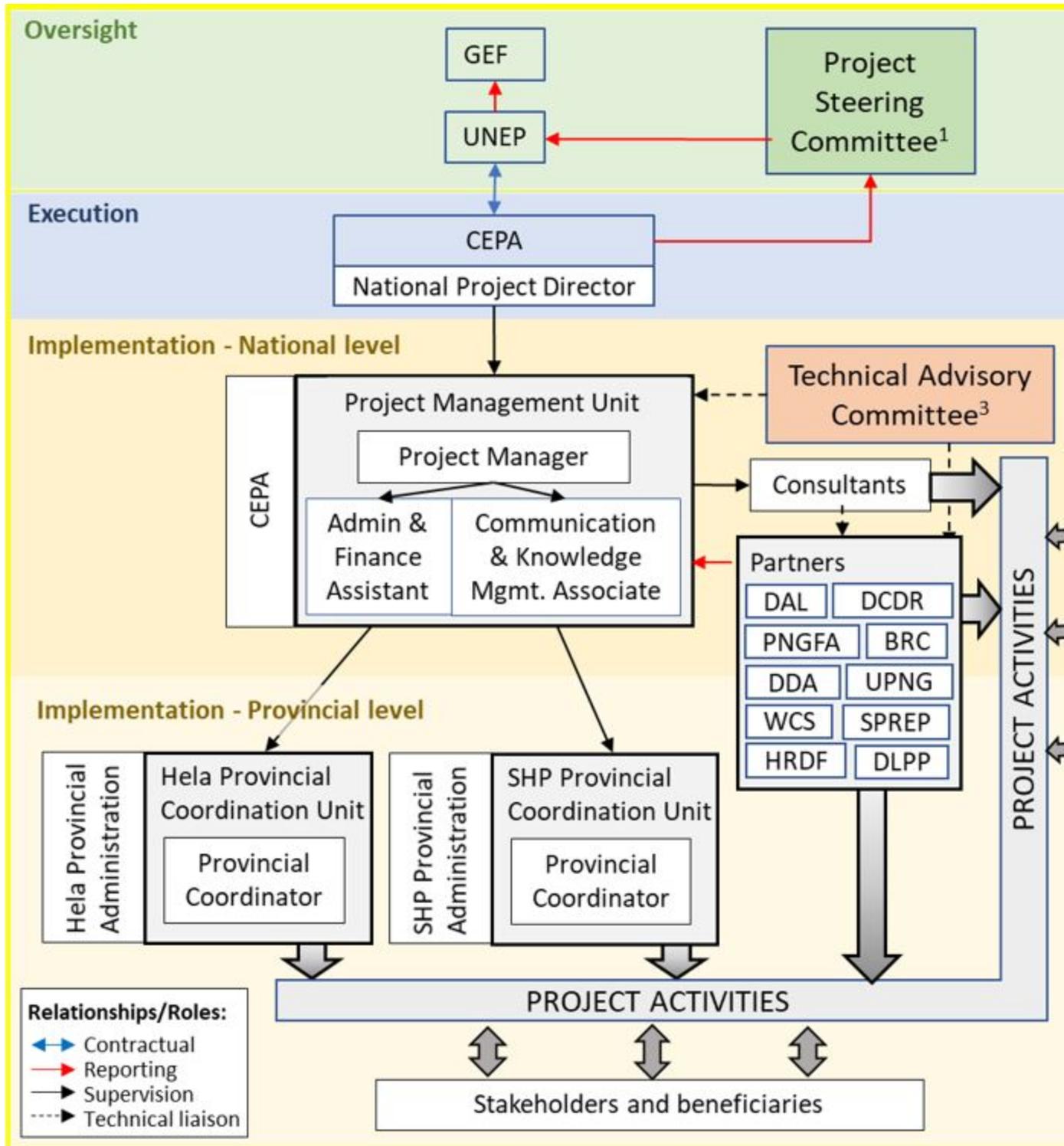


FIGURE 13: PROJECT ORGANOGRAM

Project Steering Committee to be composed of representatives from UNEP, CEPA, project partners and project beneficiaries (e.g. local administration, landowners, CBOs, and women's groups). 2 Consultants needed for: (i) Chief Technical Advisor, (ii) land use planning; (iii) environmental compliance monitoring;

(iv) capacity development; (v) environmental legislation; (vi) Natural Capital Assessment; (vii) green business development and sustainable financing. 3 Project Technical Committee to be composed of representatives from PMU and project partners.

Abbreviations: BRC (Binatang Research Centre); CEPA (PNG Conservation and Environment Protection Agency); DAL (Department of Agriculture and Livestock); DCDR (Department of Community Development and Religion); DDA (District Development Authorities); DLPP (Department of Lands and Physical Planning); GEF (Global Environment Facility); HRDF (Hela Rural Development Foundation); PNGFA (PNG Forest Authority); SPREP (Secretariat of the Pacific Regional Environment Programme); UNEP (United Nations Environment Programme); UPNG (University of PNG); WCS (Wildlife Conservation Society).

The Project will be linked to the institutional landscape and key processes as follows:

The Project is executed by the CEPA, which acts as the Focal Point for UNCCD and CBD, ensuring that the Project is well coordinated with the national activities under these conventions. Through the recently established LDN Working Group, coordination will take place with key national agencies that will act as project Partners, including the Department of Lands and Physical Planning (DLPP), Department of Agriculture and Livestock (DAL) and PNG Forest Authority (PNGFA). Coordination with the LDN Working Group will also ensure that the Project meets its objectives as an LDN transformative project that contributes effectively to the achievement of PNG's voluntary LDN targets. The project will also promote harmonization of sectoral legal and policy frameworks across state agencies to drive LDN across sectors and provincial borders. As such, CEPA will promote coordination to include relevant agencies beyond the project partners, such as with the National Agriculture and Quarantine Inspection Authority with a view to better controlling illegal introduction of alien invasive species and export of wildlife across national borders.

The Project will closely coordinate with other relevant projects as described below. General details on the listed projects are available in Section 2.6. The project and the two additional projects under GEF 7 are complementary both in terms of approaches and geographical scope. Cooperation among the projects will focus on creating synergy, avoiding duplications, and maximizing the use of funds by coordinating the work plans and budget, as appropriate. Where possible, similar activities under the different projects will be carried out jointly, such as capacity building at national level, efforts to mainstream land use planning and biodiversity into national policies, exchanging lessons learnt and using joint databases for knowledge management.

(a) The GEF 7 "Enabling sustainable production landscapes in Eastern Highlands and Western Highlands Provinces for Biodiversity, Human Livelihoods and Well-being" Project (GEF ID 10151). Following a coordinated project development, the Project will closely coordinate implementation with this project that focuses on planning, process design, implementation, and exchange of lessons learnt on targets pursued by both projects in adjacent Highland provinces: i) land use planning (Output 1.1.4), ii) SFM, community-based forest management and forest restoration (Output 2.1.2), iii) land-based value chain development (Output 2.1.3), iv) business planning (Output 3.1.3), v) review of regulatory frameworks (Output 1.1.1), vi) establishment of land use planning platforms (Output 1.1.4), vii) project monitoring (Output 3.1.1.), viii) external communication, ix) knowledge management (Output 3.1.2), and x) exchange of farmers, government staff and women's group members to learn lessons across projects, incl. on capacity building of small farmer enterprises and value chain development (Output 3.1.4).

(b) The GEF 7 "Establishing System for Sustainable Integrated Land-use Planning Across New Britain Island in Papua New Guinea" Project (GEF ID 10239). Thematic fields of coordination will focus on finalizing and endorsing the National Sustainable Land Use Policy (Output 1.1.1), the use of the sustainable land use planning information and coordination systems and tools to be established by this

project and the enriching of this system with integrated information on environmental assessment processes and NCA (Output 1.1.4), value chain development and market linkages (Output 2.1.3), capacity development on environmental compliance monitoring and enforcement (Output 1.1.3), management of community conservation areas (Output 2.1.2), knowledge management and sharing of lessons learnt (Output 3.1.2).

Furthermore, the Project will coordinate for specific thematic subjects with the following GEF projects:

- (c) GEF-funded 'Sustainable Financing of Papua New Guinea's Protected Area Network' Project (GEF ID 9536) to transfer lessons learnt on implementing a range of sustainable landscape finance mechanisms in the PNG context into the implementation of Output 2.1.4.
- (d) GEF-funded 'Building National and Regional Capacity to Implement Multilateral Environmental Agreements by Strengthening Planning and the State of Environmental Assessment and Reporting in the Pacific' Project (GEF ID 5195) for lessons learnt on capacity development (Output 1.1.3) and the establishment of national databases (Output 3.1.2)
- (e) GEF-funded regional 'Strengthening national and regional capacities to reduce the impact of Invasive Alien Species on globally significant biodiversity in the Pacific' Project (GEF ID 9410) for relevant capacity development and insight on relevant technologies for invasive alien species.
- (f) GEF-funded regional 'Ratification and Implementation of the Nagoya Protocol in Countries of the Pacific Region' Project (GEF-ID 5634) for capacity development.

Coordination with other projects will focus on:

- (g) The 'PNG LNG Project' (ExxonMobil): The Project will coordinate with the PNG LNG Project in terms of baseline data on biodiversity as a basis for NCA (Output 1.1.3), and land use planning (Output 1.1.4), SLM interventions including selection of target villages (Output 2.1.1), and SFM interventions (Output 2.1.2). Furthermore, the Project will closely coordinate with the PNG LNG Project on the biodiversity offsetting programme (Output 2.1.4). The implementer of the PNG LNG Project, ExxonMobil is also a cofinancier and Partner and therefore coordination will also encompass project management issues.
- (h) Strengthening Integrated Sustainable Landscape Management in Enga Province of Papua New Guinea: coordination will focus on exchanging lessons on integrated landscape management across neighbouring Highland provinces.
- (i) The 'Market for Village Farmers' Project (IFAD): SLM activities, value chain development focusing on potato products, and relevant capacity development are areas for collaboration with the project. The local partners implementing these activities for the IFAD project match those the Project works together with for the same purpose (DAL Extension Service operating out of Gorokha, Eastern Highlands, FPDA, and NARI), which will ease coordination.
- (j) The 'PNG Biodiversity Program' (USAID): coordination opportunities revolve around the SFM component, particularly the preparation of Conservation Deeds. Given that both projects engage WCS for

the purpose, this opens considerable opportunities for collaboration. In addition, coordination on value chain development and gender aspects will be pursued.

(k) The 'Agriculture Commercialization and Diversification Project' (World Bank): Coordination will focus on value chain development, particularly coffee.

(l) The Project will also have linkages to the Regional Pacific NDC Hub support via CCDA and the Regional REDD+ Project via PNGFA.

7. Consistency with National Priorities

Describe the consistency of the project with national strategies and plans or reports and assessments under relevant conventions from below:

NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc.

National priorities arising from international commitments

The proposed project is fully consistent with PNG's national priorities for sustainable development and environmental sustainability and its efforts to address the drivers and impacts of land degradation towards the achievement of LDN. PNG's national development strategy is expressed through the Vision 2050, the Development Strategic Plan 2010-2030, and the Medium-Term Development Plan III (2018-2022), in decreasing level of hierarchic order and at increasing level of detail. These strategic development plans consistently maintain commitment towards sustainable development and PNG's international obligations arising from Multilateral Environmental Agreements (including the Convention on Biological Diversity (CBD), the United Nations Convention to Combat Desertification (UNCCD), and the United Nations Framework Convention on Climate Change (UNFCCC)). No provincial strategic development plans exist for Hela and Southern Highlands Provinces. The Project conforms to PNG's high-level strategic goals defined in PNG's Vision 2050, the DSP 2010-2030, and the MTDP III, 2018- 2022, the targets of which are implemented along 8 Key Result Areas (KRA). PNG's Voluntary National Review aligned these KRAs with the SGDs. Accordingly, the Project will directly contribute to KRA 7 'Responsible Sustainable Development', which is under the lead coordination of the CEPA. In addition, the Project is aligned with KRA 1 'Increased Revenue and Wealth Creation'.

The draft National Sustainable Land Use Policy 2018 is currently being developed that recognizes the threats of climate change to sustainable land use, environment and biodiversity in PNG and highlights the importance of incorporating climate and disaster risk concerns in the land using planning for risk reduction and sustainable development. The Policy will be implemented through a Strategic Land Use Plan that will guide physical development throughout the country and recognizes three broad land use zone categories, including for development promotion, sustainable rural development, and conservation. The Project is well aligned with the draft policy, particularly in its objectives to establish cross-sectoral land use planning, including the institutional framework for land use planning, and the zoning procedures resulting from the identification of the best possible uses of single landscape units.

The National Biodiversity Strategy and Action Plan for PNG is seen as the instrument to protect rural areas from the impacts of developments on landscape quality, conservation and enhancement of wildlife species and biological diversity. The Project is well aligned with the NBSAP, particularly through its first three goals, which include Goal 1 'To conserve, sustainably use, and manage the country's biological diversity?', Goal 2 'To strengthen and promote institutional and human capacity building for biodiversity conservation, management and sustainable use?', and Goal 3 'To strengthen partnership and promote coordination for conserving biodiversity?'. Out of the programmes under the NBSAP, the Project provides a direct contribution to the following programmes and subordinate actions:

- (a) (1) ?Policy and Legislation?, particularly to action ?review and update the national legislation to ensure complementarily in sustainable resource use and the incorporation of biodiversity conservation considerations including protection of intellectual property? through Project Output 1.1.1;
- (b) (2) ?Financial and Technical Resources?, particularly to addressing the ?design and implement a spectrum of sustainable financing mechanisms for NBSAP implementation? through Output 2.1.4;
- (c) (3) ?Human Capacities?, including to ?Integrate biodiversity concerns into the training curricula of rural development and extension staff, particularly in the fields of agriculture, forestry and fisheries? through Output 1.1.3;
- (d) (6) ?In-situ and ex-situ biodiversity conservation?, particularly to ?Develop regional (watershed/provincial) conservation programmes to integrate conservation activities and protected area management with regional (watershed/provincial) land use planning? through Output 1.1.4,
- (e) (7) ?Measures of sustainability use in biodiversity use and incentives and alternatives?, particularly action ?develop, document, and adopt standardised criteria and methodologies for economic valuation of biodiversity, tailored to the requirements of individual decision-making agencies? and ?Introduce a system of direct incentives to promote the conservation and sustainable use of biodiversity? through Outputs 1.1.4, 1.1.5, and 3.1.3;
- (f) (8) ?Education and public awareness?, particularly ?ensure that development personnel, land-use planners, aid agencies and the national and provincial planning authorities have access to information about biodiversity? through Output 3.1.3.

The Project is further aligned with the following key legislation, policies, and strategies:

- (g) National REDD+ Strategy (2017 ? 2027) which identifies both national-level development and land use planning, and integrated subnational planning, the strengthening of law enforcement capacities, and the development of a sustainable agricultural production sector as key priorities.
- (h) National Agriculture Sector Plan (2019 ? 2029) which is in the process of being developed and will supersede the National Agriculture Development Plan (2007 ? 2016);
- (i) Land Registration (Amendment) Act 2009 that calls for a confirmation of the main intended use of any piece of land;
- (j) Incorporated Land Group (Amendment) Act 2009, which ensures the rights and benefits of landowners;
- (k) National Food Security Policy (2016 ? 2026) which works to ensure food security in conjunction with other policy measures within a sustainable development policy framework;
- (l) National Climate Compatible Development Management Policy 2013, which includes a national-level carbon Neutrality goal of 50 percent by 2030 and 100 percent by 2050;

(m) Agriculture Smart Policy involves assisting farmers to switch to commercial operations and to make informed decisions.

(n) The Government of PNG's LDN Commitments were defined through the UNCCD LDN Target Setting Programme. As part of the LDN voluntary target setting, PNG has set an ambitious target of restoring 7.73 million hectares of degraded land and will be working with stakeholders in the country to meet the target by 2030. Under the LDN targets, the Project directly contributes to specific targets identified for Highland Provinces, which include capacity building of communities in SLM, sustainable production, encouraging Public-Private Partnerships, and the establishment of SLM technologies across 200,000 ha. Additionally, the Project addresses specific targets for Hela and Southern Highlands Provinces, which are defined as biodiversity offsetting in petroleum projects, proper enforcement or implementation of existing policies and laws on petroleum, review of all resource laws covering mining and petroleum, and the rehabilitation of 100,000 ha.

PNG is a party to several Multilateral Environmental Agreements, including the Rio Conventions, viz. the United Nations Convention to Combat Desertification (UNCCD), the Convention on Biological Diversity (CBD), and the United Nations Framework Convention on Climate Change (UNFCCC). These bring important implications, both in terms of national commitments as well as support rendered to PNG.

PNG ratified the CBD in 1993, has accessed the Cartagena Protocol in 2006 but is not a party to the Nagoya Protocol on Access and Benefit Sharing. The country has submitted its second National Biodiversity Strategy and Action Plan in 2019 and its Fifth National Report to the CBD in 2017. The Project is fully aligned with PNG's CBD obligations, as it addresses several key priorities identified in the NBSAP (for details refer to sections further above).

PNG ratified the UNCCD in 2000, has prepared a National Action Plan, and has submitted its national LDN targets in 2019. The Project is a key instrument to address PNG's obligations arising from UNCCD membership: the revision of the NAP will be supported by the Project, which at the same time is one of the first LDN transformative projects of the country that directly contributes to achieving PNG's voluntary LDN targets.

Under UNFCCC, PNG is a Non-Annex I Country that ratified the Kyoto Protocol in 2002 and the Paris Agreement in 2016. PNG has submitted two NDCs but has not prepared a National Adaptation Plan. Under REDD+, PNG has submitted the REDD+ Strategy, the Safeguards Information, and the Forest Reference Levels. The Project is fully aligned with the priorities identified in the NDC and the REDD+ Strategy, as specified above.

8. Knowledge Management

Elaborate the "Knowledge Management Approach" for the project, including a budget, key deliverables and a timeline, and explain how it will contribute to the project's overall impact.

The Project's overall Knowledge Management (KM) strategy builds on the GEF's Knowledge Management Approach as described in the STAP "Managing knowledge for a sustainable future" publication and the UNEP Knowledge Management Strategy 2014-17. The results of KM activities will be

explicitly measured through the Project's results framework (refer to indicator 3.1.1: Increase in use of capacities in practically applying SLM, SFM and the value of biodiversity in land use among targeted beneficiaries, disaggregated by sex) as well as the M&E plan (Annual lessons learnt reports; Project monitoring database). KM activities are primarily contained in Outcome 3 ?3.1. Project results disseminated enabling scaling up and supporting land use planning, ecosystem good and services, and LDN? and particularly Output 3.1.2 ?Output 3.1.2. Stakeholders effectively absorb knowledge and best practices emerging from the project to implement SLM and SFM?.

Utilization of Lessons Learnt for Project Design

The PPG Phase conducted a review of Evaluation Reports of relevant past GEF projects in PNG to identify lessons learnt and to inform the design of the present Project. Relevant findings included:

- ? Review the weak EIA process that has not been reviewed since 2004 (GEF-5510)
- ? Map degradation and emphasize collaboration with PNGFA (GEF-5510)
- ? Spread out capacity building activities over project period in order not to overburden CEPA staff (GEF-5510)
- ? Limited ability of CEPA to implement projects on the ground due to lack of physical presence (GEF-5510)
- ? Work with established NGO partners on the ground to achieve cost-effective and lasting biodiversity conservation outcomes (GEF-5510)
- ? Contract a full-time Project manager (GEF-5510)
- ? Host the PMU within the premises of the hosting institution (GEF-5510)
- ? Conduct the inception workshop within the first few months of the project (GEF-5510)
- ? Actively engage all implementing partners into the development of the ProDoc (GEF-5510)
- ? Establish exchange between community conservation areas (GEF-3954)

Utilization of Knowledge

The Project utilizes UNEP knowledge by tapping on the UNEP Knowledge Depository (<https://wedocs.unep.org/>) that includes numerous entries for PNG.

Regional resources primarily available with SPREP and SPC are among the most important source of information and data for Project development and implementation:

- ? The PNG Environmental Data Portal hosted by SPREP (<https://png-data.sprep.org/>) contains the most complete set of environmental information and knowledge in form of raw data, reports, maps, national documents, etc. on PNG's environment.

? The Lessons Learnt and Best Practices in Environmental Management repository (<https://www.sprep.org/lessons-learned-and-best-practices-environment-management>) contains important lessons.

? The Pacific Climate Change Portal (<https://www.pacificclimatechange.net/>)

? The Pacific Network for Environmental Assessment (<https://pnea.sprep.org/>)

? The Pacific Islands Protected Area Portal (<https://pipap.sprep.org/>)

? Geospatial Data Repository for the Pacific Region (<http://www.pacgeo.org/>)

? The Pacific Data Hub (<https://pacificdata.org/>)

? The Geoscience, Energy and Maritime Division knowledge repository (<https://gem.spc.int/>)

Global resources on Earth Observation, the laws, and SLM / SFM technologies utilized for project development and implementation include:

? Trends.Earth (extension to QGIS; <https://trends.earth/docs/en/>)

? Global Forest Watch (<https://www.globalforestwatch.org/>)

? EarthMap (<https://earthmap.org/>)

? UN Biodiversity Lab (<https://unbiodiversitylab.org/>)

? World Bank Climate Knowledge Portal
(<https://climateknowledgeportal.worldbank.org/country/papua-new-guinea/>)

? FAO-Lex (<http://www.fao.org/faolex/en/>)

? Eco-Lex (<https://www.ecolex.org/>)

? WoCat (<https://www.wocat.net/en/>)

? World Database on Key Biodiversity Areas (<http://www.keybiodiversityareas.org/>)

? World Database on Protected Areas (<https://www.iucn.org/theme/protected-areas/our-work/world-database-protected-areas>)

National knowledge resources are of limited accessibility. The websites of PNG government agencies (including CEPA, CCDA, PNGFA, and DAL) contain limited knowledge resources and are periodically unavailable. Similarly, the very valuable PNG National Forest Monitoring System portal (<http://png-nfms.org/portal>) is periodically unavailable during project development. The University of PNG GIS Unit has valuable publicly non-accessible spatial data and supports project development and implementation.

These resources were actively utilized during the PPG and will continue to be utilized throughout the project implementation, by i) availing data (geospatial data), information (biodiversity status, etc.) and guidelines (e.g. for natural capital and environmental assessment, etc.), ii) disseminating knowledge generated through the Project by contributing them to the respective repositories, and iii) exchanging knowledge and experiences through thematic networking with regional partners and networks.

Key Learnings to be Established and Information Management Strategy

The Project's key learning will be the demonstration of viable integrated landscape management that mainstreams biodiversity and contributes to LDN in the PNG Highlands. The Project will deliver lessons on piloting cross-sectoral land use planning that is embedded into the existing institutional landscape and that integrates environmental assessment processes and is based on scenario analyses applying the values of natural capital. Important lessons will also be learnt on the process of environmental assessments, including of NCA in the context of the PNG Highlands. The testing and piloting of SLM and SFM technologies, along with the piloting of sustainable financing mechanisms to achieve LDN will constitute further important learnings from the Project.

The external communication of the Project approach and its findings to other relevant organizations will be jointly assumed by UNEP, and CEPA. CEPA and national partners will communicate project results within PNG through the channels described in the Project's communication strategy above.

The Project's information management strategy will pave the way for the successful implementation of the Project's two evaluations by collecting information relevant to be able to answer the evaluation questions clustered along UNEP's evaluation criteria of relevance, effectiveness, efficiency, impact, sustainability, replication, and upscaling, as well as factors influencing performance. The Project's Midterm and Terminal Evaluation findings will be publicly shared on the UNEP Evaluation Website located at <https://wedocs.unep.org/handle/20.500.11822/3/discover>.

The Project's information management strategy will strongly build on the project monitoring database, which will be established as described in **Section 6** (also refer to Activity 3.1.1.4). The monitoring database will maintain all monitoring processes and information in a common space and aggregate information to gauge progress towards indicator targets. The monitoring database will be kept up to date at any given time, and its completeness will be verified annually, prior to the preparation of PIRs. The database will also serve as a most important source of data for the Midterm Review/Evaluation and the Terminal Evaluation of the Project.

Environmental data collected

The Project will generate geospatial and environmental data through the tracking of impact indicators, the tracking of GEF Core Indicators, and specifically through the delivery of Output 1.1.4 (land use planning), Output 1.1.3 (natural capital assessment), Output 1.1.5 (spatially explicit compliance monitoring of environmental regulations), Outputs 2.1.1 and 2.1.2 (spatially explicit documentation of piloted SLM and SFM technologies).

The data will be hosted in i) an environmental compliance monitoring database maintained by CEPA (refer to Activity 1.1.5.2); ii) the PMU monitoring system (all data, refer to Activity 3.1.1.4); iii) the Project website; iv) the cross-sectoral database for lessons learnt and best practices developed by GEF-10151, which will host the Project's best practices on SLM, SFM and NCA; v) on UPNG's GIS database; vi) DLPP's database on land use plans and vii) relevant SPREP web-based databases. The Executing Agency CEPA, the PMU, the GEF-10151 project, UPNG, and DLPP will be responsible for managing the data, which will remain licensed by the Project until its closure, upon which the license will be transferred to CEPA and DLPP. The geospatial data on planned project interventions (e.g., community-based forest management/conservation areas, land use plans, areas under different types of restoration/SLM practices,

etc.) will be shared with the concerned stakeholders. Geospatial data referencing approved and implemented interventions will be made publicly accessible through appropriate national geospatial databases (e.g. PNG NFMS web-portal) and certain datasets (e.g., land use plan zonation, etc.) will be uploaded in the PNG Environmental Data Portal hosted by SPREP and other relevant regional repositories. Geospatial datasets on biodiversity, land use / land cover, land degradation, spatially explicit natural capital assets and their values, LDN indicators will be used in the Project's communication strategy.

Data collection and processing technologies: Data will be collected through social surveys (e.g. Natural Capital Assessment), as well as a combination of Earth observation and field surveys (e.g. mapping of degradation hotspots, status of land degradation, environmental compliance monitoring), as well as through remote sensing and geospatial analysis (status and trends of land use/land cover, land degradation, LDN indicators, environmental compliance monitoring, spatially explicit valuation of natural capital).

Data Management Plan

The Data Management Plan specifies the type of data, its formats, storage, and preservation provisions, sharing and public access as well as respective roles and responsibilities of data management.

? Data Types: The Project will generate both digital and non-digital data. Non-digital data will be converted to digital data via manual entry. Data will be solely primary data and no metadata will be collected. Data will be collected as social surveys, biodiversity surveys, participants of trainings, etc.

? Data Formats: The Project will maintain data in common machine-readable formats, which will enable their wide interchangeability and potential for independent use and validation. These formats will include Microsoft Office (e.g. .docx, .xlsx, .mdb, .ppt), and common GIS formats (e.g. .shp, .gdb, .tiff, .json, etc.).

? Data Storage and Preservation: Data will be stored in a safe environment and adequate measures will be taken for its long-term preservation. All data will be stored on multiple computers at the PMU, and regular physical backups will be created on two external hard drives. In addition, the Project will purchase cloud storage space with automatic data backup. The Administrative and Finance Assistant will additionally be responsible for creating weekly manual backups of relevant data. Besides, spatial data will be maintained at the UPNG GIS Unit that will provide continuous mapping support to the Project through a subcontract. Data will be backed up here as well.

? Data Sharing and Public Access: Spatial data that is not specific to project implementation and yields potential interest for a broader target audience will be made available publicly through the project website, the database on best practices of SLM, SFM and NCA, as well as national and regional data repositories presented above. Any social data (e.g., socio-economic baseline data for land use planning) will be anonymized to protect personal privacy. Data remains proprietary of the Project and the use of publicly available data will require the recognition of the Project as the data source. Upon project closure, intellectual property rights over the data will be transferred to the Government of PNG, represented by CEPA.

? Roles and Responsibilities: The Communication and Knowledge Management Associate (CKMA), supported by the Administrative and Finance Assistant and supervised by the National Project Manager will be responsible for data management, including manipulation, safeguarding, sharing, and managing public access. In terms of data acquisition and collection, the CTA will be responsible for providing guidance to the CKMA on data formats and collection methods to other Project members and Partners, as well as for collecting information personally. PMU staff and Partners will be responsible for collecting data and information related to the technical components under their respective responsibilities. The budgetary implications of data management are covered from the GEF Fund within the fund allocation of the CKMA, the NPM, the CTA, various service contracts and consultancies.

? Communication of collected and analysed data: Collected and analysed data will be communicated through i) written reports produced by the concerned consultants and service contract holders, ii) selected spatially explicit data cleared for public release through the various geospatial platforms described above, iii) the environmental compliance monitoring database, which will be restricted for viewing by concerned agencies, and iv) the project website.

Resources for data science: The Project will utilize the services of partners and subcontractors as well as of consultants for collecting, analysing, interpreting, and communicating data. The budget allocation towards Output 3.1.2. Stakeholders effectively absorb knowledge and best practices emerging from the project to implement SLM and SFM? is US\$ 95,000, which consists of allocations for staff and consultant time of the TA, NPM, and the AFA, along with subcontracts for video, website, and printed matter production.

Sharing with stakeholders:

The Project will ensure that all relevant information is duly disclosed to stakeholders and the public through an active, targeted, and continuous process that will form part of the Project's Communication Strategy. Throughout project implementation, incl. in the process of preparing Annual Work Plans, the PMU will assess stakeholder who may potentially be affected by individual activities. Targeted measures will be taken to engage these affected stakeholders. In compliance with FPIC procedures, proper dissemination of information will be ensured particularly for the engagement of local communities so that these can take informed decisions on whether to approve of and engage on planned project activities. Potential impacts will be assessed in terms of environmental and social aspects, presented to the stakeholders and if required, amendments and mitigating options will be identified. Updates on project progress (incl. progress towards indicator targets) and on stakeholder engagement will be disclosed regularly through i) Project Steering Committee meetings, ii) regular progress reporting as per UNEP and GEF requirements, and iii) all other communication platforms utilized by the Project as specified below.

Special attention will be paid to enabling an understanding of and disclosing of the environmental and social risks and any applicable mitigation measures. Risk assessment will be a continuous process and results will be disclosed synchronously with periodic GEF and UNEP reporting, which will document risk assessment, mitigation measures and any applicable grievances. Disclosure will be done through periodic reporting as well as through the Project's website. In a similar manner, grievances and measures for their resolution will be disclosed as described in **Project Document Appendix 21 Stakeholder Engagement Plan**. In addition, the PMU will maintain a database and activity file on the details of all public

consultations, disclosure information and grievances collected throughout the project, which will be accessible for public review on request.

Information dissemination

Information will be disseminated using the channels described below:

- ? Posters on public display: Posters will rather carry images and will use limited text as most people in rural communities in the targeted landscapes are illiterate.
- ? Notice board: Notice boards inside churches, clinics, shops and in front of government offices will be utilised. The messages will be short and direct with use of images /cartoons or photographs.
- ? Community focal persons: Communities have community champions who have a responsibility as a contact person. Usually, these people have some sort of community leadership as youth, women's representative, LLG member, schoolteacher, or health worker. These individuals will be equipped with posters or other awareness material to support their work.
- ? Project website: The website will be used as a repository of project information and dissemination at national and international levels.
- ? Social media sites: The Project will maintain an active Facebook site, which is the most used social media platform in PNG. Project events, messages, and achievements will be disseminated regularly using this channel. The Project will liaise with the communication focal points of stakeholders, including of government departments to ensure that the Project's Facebook posts are widely shared.
- ? Brochures, bulletins, press releases: The Project will prepare biannual newsletters that will be primarily shared electronically. The newsletters will provide updates from the project and help to disseminate information and strengthen collaboration primarily among the implementing stakeholders.
- ? Policy briefs: Policy briefs will be prepared from the Project's key policy level messages and will be used to disseminate information and to delivery advocacy on important issues to key policy makers.
- ? Local radio / TV: The Project will contract media professionals for developing features to be broadcasted in provincial TV and radio channels.
- ? Demonstration sites: All practical implementation of SLM and SFM activities such as intercropping, agroforestry, SALT, nurseries, etc. will be demonstrated at demonstration sites. There may be one demonstration site established in each of the two provinces.
- ? Video spots: Contracted media professionals will develop short video spots carrying key project messages, demonstrating progress and results. These spots can easily be shared on social media platforms, including on Facebook.
- ? Online database to disseminate best practices of SLM, SFM, and NCA: The Project will develop an online database (refer to Output 3.1.4), possibly as part of the SPREP PNG Environmental Data Portal.[1] This online database will be used to disseminate information on best practices of SLM, SFM and NCA from across PNG. The Project's technical results and best practices will be disseminated through this channel.

[1] <https://png-data.sprep.org/>

9. Monitoring and Evaluation

Describe the budgeted M and E plan

The Project's Monitoring Plan and Reporting was designed following standard UNEP and GEF policies, procedures, and instruments, as described in the GEF Policy on Monitoring 2019, GEF Guidelines on Project and Programme Cycle Policy 2020, and the UNEP Programme Manual. The Project's monitoring plan will ensure that monitoring is i) based on reliable data through the use of standardized protocols, ii) relevant, with a balanced presentation of evidence, findings, and recommendations, iii) engaging stakeholders into monitoring, iv) compliant with ethical standards to ensure that conflicts of interest are avoided, and violations are reported safeguarding confidentiality. Substantive and financial project reporting requirements are summarized in Project Document Appendices 7 and 8. Reporting requirements and templates are an integral part of the UNEP legal instrument to be signed by the Executing Agency and UNEP. The Project Results Framework presented in Project Document Appendix 4 includes SMART indicators for each expected outcome as well as mid-term and end-of-project targets. These indicators along with the key deliverables and benchmarks included in Project Document Appendix 6 will be the main tools for assessing project implementation progress and whether project results are being achieved. The means of verification and the costs associated with obtaining the information to track the indicators are summarized in Appendix 20. Other M&E related costs are also presented in the Costed M&E Plan (Project Document Appendix 7) and are fully integrated in the overall project budget. UNEP project oversight and monitoring will be guided by the UNEP Project Supervision Plan (separately attached document submitted to the UNEP Project Review Committee). The monitoring approach identifies entry points for stakeholder engagement and participatory monitoring, through the engagement of the PSC, the TAC, and local community members into monitoring activities. M&E related costs are also presented in the Monitoring Plan and are fully integrated in the overall project budget. With US\$ 180,000, the Project's monitoring budget equals 5.13% of the GEF fund, which is in line with the 5% target for GEF-7 projects.

The M&E plan will be reviewed and revised as necessary during the project inception workshop to ensure project stakeholders understand their roles and responsibilities vis-à-vis project monitoring and evaluation. The Monitoring Plan along with the SMART-ness of indicators, their frequency of monitoring and associated budgets and responsibilities will be reviewed during the Inception Phase and updated during the Inception Workshop. The Inception Phase will also serve the establishment of certain indicator baselines. Day-to-day project monitoring is the responsibility of the project management team, but other project partners will have responsibilities to collect specific information to track the indicators. The project Steering Committee will receive periodic reports on progress and will make recommendations to UNEP concerning the need to revise any aspects of the Results Framework or the M&E plan. Project oversight to ensure that the project meets UNEP and GEF policies and procedures is the responsibility to the Task Manager in UNEP-GEF. The Task Manager will also review the quality of draft project outputs, provide feedback to the project partners, and establish peer review procedures to ensure adequate quality of scientific and technical outputs and publications. At the time of project approval, the baseline information for 14 out of 16 impact indicators is available. Baseline data gaps will be addressed during the Inception Phase.

Project supervision will take an adaptive management approach. The project supervision plan (Separately annexed document) will be communicated to the project partners during the inception workshop. The emphasis of the UNEP Task Manager supervision will be on outcome monitoring but without neglecting

project financial management and implementation monitoring. Progress vis-?-vis delivering the agreed project global environmental benefits will be assessed with the Project Steering Committee at agreed intervals. Project risks and assumptions will be regularly monitored both by project partners and UNEP. Risk assessment and rating is an integral part of the Project Implementation Review (PIR). The quality of project monitoring and evaluation will also be reviewed and rated as part of the PIR. Key financial parameters will be monitored quarterly to ensure cost-effective use of financial resources.

A mid-term management review or evaluation will take place at the end of Project Year 3 as indicated in the project milestones (Project Document Appendix 5). The review will include all parameters recommended by the GEF Evaluation Office for terminal evaluations and will verify information gathered through the GEF tracking tools, as relevant. The review will be carried out using a participatory approach whereby parties that may benefit or be affected by the project will be consulted. Such parties were identified during the stakeholder analysis (see Project Document Appendix 20 Stakeholder Engagement Plan). The Project Steering Committee will participate in the mid-term review and develop a management response to the evaluation recommendations along with an implementation plan. It is the responsibility of the UNEP Task Manager to monitor whether the agreed recommendations are being implemented.

In line with the GEF Evaluation requirements and the UNEP Evaluation Policy, the project will be subject to an independent Mid-Term Evaluation or management-led Mid-Term Review at mid-point, when required, and an independent Terminal Evaluation or a management-led Terminal Review, with a quality assessment and ratings? validation performed by the Evaluation Office, at the end of the project. In case a Review is required, the UNEP Evaluation Office will provide tools, templates, and guidelines to support the Review consultant. For all Terminal Reviews, the UNEP Evaluation Office will perform a quality assessment of the Terminal Review report and validate the Review?s performance ratings. This quality assessment and validation will be attached as an Annex to the Terminal Review report. However, if an independent Terminal Evaluation (TE) of the project is required, the Evaluation Office will be responsible for the entire evaluation process and will liaise with the Project Manager and the project implementing partners at key points during the evaluation. The TE will provide an independent assessment of project performance (in terms of relevance, effectiveness and efficiency), and determine the likelihood of impact and sustainability. It will have two primary purposes: (i) to provide evidence of results to meet accountability requirements, and (ii) to promote learning, feedback, and knowledge sharing through results and lessons learned among UNEP staff and implementing partners. The direct costs of the evaluation will be charged against the project evaluation budget. The TE will typically be initiated after the project?s operational completion[1]. If a follow-on phase of the project is envisaged, the timing of the evaluation will be discussed with the Evaluation Office in relation to the submission of the follow-on proposal. The draft TE report will be sent by the Evaluation Office to project stakeholders for comment. Formal comments on the report will be shared by the Evaluation Office in an open and transparent manner. The project performance will be assessed against standard evaluation criteria using a six point rating scheme. The final determination of project ratings will be made by the Evaluation Office when the report is finalized. The evaluation report will be publicly disclosed and will be followed by a recommendation compliance process. The evaluation recommendations will be entered into a Recommendations Implementation Plan template by the Evaluation Office. Formal submission of the completed Recommendations Implementation Plan by the Project Manager is required within one month of its delivery to the project team. The Evaluation Office will monitor compliance with this plan every six months for a total period of 12 months from the finalisation of the Recommendations Implementation Plan. The compliance performance against the recommendations is then reported to senior management on a six-monthly basis and to member States in the Biennial Evaluation Synthesis Report.

The GEF 7 Core Indicator Worksheet is attached as Project Document Appendix 16. These will be updated at mid-term and at the end of the project and will be made available to the GEF Secretariat along with the project PIR report. The costed monitoring plan is presented in the table below.

Type of M&E and Reporting Activity	Responsible Parties	GEF Budget (US\$)	Co-finance (US\$)	Time Frame
M&E and reporting activities included in staff and consultant expenses				
Inception Report	? NPM ? CTA	1,000	0	1 month after Inception Workshop
UNEP Semi-annual progress reporting	? NPM ? CTA	5,000	0	Within 1 month of the end of reporting period (Jan 31 st / July 31 st).
UNEP Quarterly Financial Report (with notes)	? NPM ? Adm & Finance Assistant	5,000	0	Quarterly on or before 30 April 30 th , July 31 st , Oct 31 st , Jan 31 st
UNEP Annual non-expendable material purchase report	? NPM	2,500	0	Annually, by Jan 31 st
GEF Project Implementation Review (PIR)	? NPD ? NPM ? CTA	7,500	0	Annually, by July 15 th
Procurement plan (goods & services)	? CEPA (PMU: NPM & CTA)	1,500	0	Update Procurement Plan prepared during PPG within the Inception Phase
Co-financing report	? Project Partners ? NPD ? NPM	2,000	0	Within 1 month of the PIR reporting period, i.e., on or before July 31 st
Final inventory of non-expendable equipment	? CEPA (PMU: NPM)	1,000	0	Within 2 months of the project technical completion/closure
Equipment transfer letter	? CEPA (PMU: NPM)	500	0	Within 2 months of the project technical completion/closure
Final expenditure statement	? CEPA (PMU: NPM)	1,000	0	Within 3 months of the project technical completion/closure
Project Final Report	? CEPA (NPD, PMU: NPM & CTA)	4,000	0	Within 2 months of the project technical completion/closure
Grievance report	? CEPA (PMU: NPM & CTA)	2,500	0	Quarterly, review annually

Type of M&E and Reporting Activity	Responsible Parties	GEF Budget (US\$)	Co-finance (US\$)	Time Frame
Tracking of project indicators (outcome, output indicators, GEF Core Indicators) including baseline data collection	? CEPA (PMU: NPM & CTA) ? Project Partners	10,000	0	Outcome/Output Indicators: as per schedule defined in Appendix 4
Monitoring database	? CEPA (PMU: NPM, Adm & Finance Assistant, CTA)	3,500	0	Continuously
Monitoring of environmental and social risks, and corresponding management plans as relevant	? PSC ? CEPA (NPD, PMU: NPM & CTA) ? Project Partners	5,000	0	Quarterly by PMU, semi-annually by PSC & Partners
Monitoring of project management risks and updating of risk log	? CEPA (NPD, PMU: NPM & CTA) ? PSC	2,500	0	Quarterly, or when needed
Stakeholder Engagement Plan implementation monitoring	? CEPA (PMU: NPM) ? Project Partners	5,000	0	Annually
Gender Strategy and Action Plan Implementation Report, including tracking of Gender Action Plan (GAP) Indicators	? CEPA (PMU: NPM & CTA) ? DCDR ? Project Partners	5,500	0	Throughout Project, as defined in GAP GAP Indicators: annually, as part of GAP implementation review)
Monitoring of Community Plan implementation	? Communication and Knowledge Management Associate	1,000	0	Quarterly, or when needed
Subtotal of M&E Costs staff & consultant costs		66,000	0	
M&E and reporting activities beyond staff and consultant expenses				
Inception Workshop	? CEPA (PMU: NPM & CTA) ? UNEP ? Partners	3,000	15,000	Within 3 months of project start
Biannual Project Steering Committee Meetings	? CEPA (PMU: NPM & CTA)	5,000	25,000	Twice annually, upon preparation of AWP & budget, and upon preparation of draft PIR.

Type of M&E and Reporting Activity	Responsible Parties	GEF Budget (US\$)	Co-finance (US\$)	Time Frame
Quarterly Technical Advisory Committee meetings	? TAC	6,000	40,000	Quarterly
Annual review meetings	? CEPA (PMU: NPM & CTA) ? Project Partners	10,000	41,538	Annual review meetings, conducted as part of Annual Work Plan & Budget preparations
Surveys for impact indicator monitoring	? NPM	20,000	0	Prior to MTR and to TE
Surveys for safeguards and project management risk monitoring	? NPM	10,000	0	
Mid-Term Review/Evaluation	? CEPA (NPD, PMU: NPM & CTA) ? Project Partners ? UNEP	30,000	0	After two years of project implementation
Terminal Evaluation	? CEPA (NPD, PMU: NPM & CTA) ? Project Partners ? UNEP	30,000	0	Within 6 months of end of project implementation
UNEP Annual Project Oversight missions	? UNEP	Agency fee	0	Annually
UNEP Project Supervision Plan	? UNEP PM	Agency fee	0	Continuously
Subtotal of M&E and reporting excluding staff & consultant time		114,000	121,538	
Total M&E Plan cost		180,000	121,538	

Project revisions may affect the evaluation costs. The main features that increase the costs are, generally, changes in the technical scope of the project, additional results, the geographic spread, or the language needs (linked to geographic spread). Where a project revision relates to such issues, the evaluation budget needs to be reviewed and possibly revised.

The implementation of the Project's monitoring plan is the mandate of CEPA as the responsible Executing Agency, which depute most tasks to the PMU. Additionally, Project Partners, UNEP, and local stakeholders share partial monitoring responsibilities:

? UNEP as the GEF Agency responsible for: participation in Inception Workshop; conducting Supervision Missions; reporting through Project Implementation Reviews on progress towards project targets, financial disbursement, risks, safeguards, gender, communication, and partnerships, reporting on Core Indicators, co-financing, commissioning independent Mid-Term Review and Terminal Evaluation.

? CEPA as the Executing Agency responsible through the PMU for: organization of Inception Workshop and Annual Review and Planning Workshops; collecting information tracking logframe indicators and

preparation of monitoring reports including PIRs, Quarterly Financial Reports, Half Annual Project Implementation Reports, Annual non-expendable material purchase reports, GEF Core Indicator Worksheets; conducting Annual Review Meetings to review project progress together with Partners and stakeholders; preparing and organizing the logistics for Midterm and Terminal Evaluations; monitoring of the implementation of the Stakeholder Engagement Plan, the Gender Action Plan, the Project Communication Plan, project management risks and social and environmental safeguards.

? Project Partners: Partners are key stakeholders with distinct responsibilities in project execution. They will take part in the implementation of the monitoring plan by participating in the Inception Workshop; collecting and collating information and forwarding them to CEPA for tracking of project progress, including through logframe indicators, GEF Core Indicators, etc.; participating in Annual Review Meetings to allow participatory monitoring of project progress; participating in the two evaluation of the Project; providing information for the annual cofinancing reports; and monitoring progress on the implementation of the Gender Action Plan, environmental and social safeguards and the Stakeholder Engagement Plan.

? PSC: The PSC will contribute to the monitoring plan by the annual review of environmental and social safeguards, and by reviewing progress towards logframe indicator targets.

? TAC: The TAC will review technical implementation of the project, including quality control of methodologies, reports, plans, etc. on a quarterly basis.

? Local stakeholders: Local stakeholders will engage in participatory monitoring, primarily focusing on the success of implementing SLM and SFM technologies.

Special Monitoring Provisions

? Monitoring stakeholder engagement: Progress and challenges in stakeholder engagement will be monitored through the monitoring of the Stakeholder Engagement Plan, including by monitoring the project-level Grievance Redress Mechanism, as identified in Workplan Activity 3.1.1.11. The monitoring of the SEP is straight-forward, as it contains an explicit action plan on stakeholder specific engagement tools, the timing and frequency of their application, concerned responsibilities and budgets. In addition, capacities and skill development will be monitored through dedicated logframe indicators (Indicators 1.1.2, 3.1.1). The monitoring of gender-responsive measures will also be conducted through the dedicated monitoring of the Gender Action Plan (Activity 3.1.1.11) as well as by monitoring gender-specific or gender-disaggregated logframe indicators (Indicators 5, 1.1.2, 2.1.1, 2.1.2, 3.1.1). The monitoring of progress related to knowledge management and communication contents will be carried out through the dedicated Workplan Activity 3.1.1.11, which amongst others will ensure the continuous monitoring of the implementation of the Project's Communication Strategy & Plan, as well as by monitoring dedicated logframe indicators (Indicator 3.1.1).

? Monitoring project management and environmental and social safeguard risks and assumptions made for the Project's Theory of Change: The Project contains a specific Workplan Activity that focuses on the review of the Project's risk log, social and environmental safeguard risks and assumptions (Activity 3.1.1.11). Project management risks will be reviewed on a quarterly basis and the risk log will be updated if needed. Furthermore, management risks will be reported in the PIRs, including the mitigating actions

taken to address specific risks. Social and environmental safeguard risks and the assumptions underlying the Project's Theory of Change will be reviewed bi-annually preceding the biannual PSC meetings. The implementation of mitigating measures will be monitored quarterly in the case of the Project-level Grievance Redress Mechanism, whereas the implementation of land use plans will be tracked through logframe Indicator 1.1.2.

? PIMS and donor reporting: The responsibility of reporting on project milestones in the Project Information and Management System (PIMS) on a six-monthly basis rest with the concerned UNEP Programme Manager, Ecosystems Division, supported by the UNEP Programme Associate, Ecosystems Division. Donor reporting requirements will be met through the annual PIRs.

[1] The timing of the evaluation expenditure should be discussed with the donor or consult with the Evaluation Office.

10. Benefits

Describe the socioeconomic benefits to be delivered by the project at the national and local levels, as appropriate. How do these benefits translate in supporting the achievement of global environment benefits (GEF Trust Fund) or adaptation benefits (LDCE/SCCF)?

The Project's benefits include the Global Environmental Benefits as described in Section 1.a.6. Besides these, the Project yield substantial direct socio-economic co-benefits to the targeted beneficiaries (refer to Section 2) and indirect benefits to implementing partners and other stakeholders.

The socio-economic benefits delivered by the Project include i) direct financial incentives for landowners to overcome the barrier to engage on SLM/SFM, ii) improved access to sustainable financing for SMEs and landowners, iii) setting up of long-term financing streams through AFOLU carbon projects and certified coffee production, iv) establishment of tax easements and subsidies that directly benefit landowners, v) improved food security through more efficient and sustainable agricultural production, vi) increase resilience and reduced vulnerability of the livelihood base to climate change and disaster risks, and vii) increased land-based livelihood opportunities particularly for women.

11. Environmental and Social Safeguard (ESS) Risks

Provide information on the identified environmental and social risks and potential impacts associated with the project/program based on your organization's ESS systems and procedures

Overall Project/Program Risk Classification*

PIF	CEO Endorsement/Approval	MTR	TE
Medium/Moderate			

Measures to address identified risks and impacts

Elaborate on the types and risk classifications/ratings of any identified environmental and social risks and impacts (considering the GEF ESS Minimum Standards) and any measures undertaken as well as planned management measures to address these risks during implementation.

This is likely a moderate risk project, especially concerning the SS 1, 2, and 7 areas. For the SS 1 and 2, precautionary approach with the readiness to handle any emerging risks in adaptive manner, through application of relevant science, is advised.

On the SS 7, the project is committed to carry out FPIC, which is usually carried out during the project development phase. While indigenous peoples may have strong tenure rights of the land in the PNG, potential impacts from the project approach to their livelihood, soil conservation approach, or long-term sustainability should respect their concerns, needs, and rights. FPIC should be carried out at the entry of the project implementation.

Guiding principles (GP 1-10 in the Section 3) should be regularly revisited during the project implementation to ensure that LNOB, human rights-based approach, gender-responsive approach and accountability (information disclosure and grievance redress mechanism) are fully complied.

Supporting Documents

Upload available ESS supporting documents.

Title	Module	Submitted
GEF-10580 SRIF PNG-Final	CEO Endorsement ESS	

ANNEX A: PROJECT RESULTS FRAMEWORK (either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).

Annex A: Project Results Framework

Project Objective	Objective level Indicators	Baseline	Targets and Monitoring Milestones	Means of Verification	Assumptions & Risks	UNEP MTS reference
To achieve biodiversity conservation and land degradation neutrality in the Southern Highlands and Hela Provinces of Papua New Guinea through integrated landscape management and natural capital assessment	Indicator 1: Contribution to national LDN targets 1.a % of national SLM target 1.b % of national rehabilitation target met	n/a	1.a: End of project Target: 25% Mid-Point Target: 10% 1.b: End of project Target: 50% Mid-Point Target: 20%	Analysis of remote sensing data, delineating relevant polygons and determining their spatial extent by CEPA, review of Community-based forest management plans by CTA ? comparison with National voluntary LND targets	Assumption 4 ?Conflict and climate change do not threaten environmental and livelihood sustainability. ?	UNEP PoW 2020-21 Subprogramme 3 ?Healthy and Productive Ecosystems?
	Indicator 2: Area of degraded agricultural land restored	0 ha	End of project Target: 39,667 ha Mid-Point Target: 15,000 ha	Analysis of remote sensing data, delineating relevant polygons and determining their spatial extent by UPNG	Assumption 4 ?Conflict and climate change do not threaten environmental and livelihood sustainability. ?	

	<p>Indicator 3: Area of landscapes under improved practices:</p> <p>3.a Area of landscapes under improved management to benefit biodiversity</p> <p>3.b Area of landscapes under sustainable land management in production systems</p>	<p>3.a: 0 ha</p> <p>3.b: 0 ha</p>	<p>3.a: End of project Target: 23,214 ha</p> <p>Mid-Point Target: 10,000 ha</p> <p>3.b: End of project Target: 21,528 ha</p> <p>Mid-Point Target: 8,500 ha</p>	<p>Analysis of remote sensing data, delineating relevant polygons and determining their spatial extent by UPNG, review of Community-based forest management plans by CTA</p>	<p>Assumption 4 ?Conflict and climate change do not threaten environmental and livelihood sustainability. ?</p>	
	<p>Indicator 4: Carbon sequestration benefits attributed to the Project</p>	<p>0 tCO₂e</p>	<p>End of project Target (at 20 years capitalization) : -7,024,789 tCO₂e</p> <p>Mid-Point Target (at 20 years capitalization) : -2,000,000 tCO₂e</p>	<p>FAO Ex-Act Tool completed by TA at Mid-Point and prior to project end, including explanatory notes</p>	<p>Assumption 4 ?Conflict and climate change do not threaten environmental and livelihood sustainability. ?</p>	
	<p>Indicator 5: Number of direct project beneficiaries disaggregated by sex</p>	<p>0</p>	<p>End of project Target: 22,000 of which 12,000 females</p> <p>Mid-Point Target: 10,000 of which 5,500 females</p>	<p>Review of project monitoring database</p>	<p>n/a</p>	
Project Outcome	Outcome Indicators	Baseline	Targets and Monitoring Milestones	Means of Verification	Assumptions & Risks	UNEP MTS Expected Accomplishment

1.1. Improved policies and legal framework for integration of natural capital valuation into land use planning adopted and implemented at the national level to support the flow of ecosystem services and LDN	Indicator 1.1.1. Proportion of adopted policy, legal and regulatory instruments on land use planning that support an enabling environment for SLM, SFM and NCA	TBD	End of project Target: 70% of instruments in force/enacted (target to be validated during Inception Phase) Mid-Point Target: 60% of instruments prepared and submitted to Parliament/ Authorities	Report on validation of PPG review of policy, legal and regulatory framework gaps; PNG National Gazette; Government documents, reviewed by CTA	Assumption 1 ?The government maintains commitment towards integrated landscape management including SLM and SFM, improved environmental monitoring and enforcement, and internalizing the true value of natural capital in economic decisions.?	PoW 2020-21 Subprogramme 3, Expected Accomplishment (a) ?The health and productivity of marine, freshwater and terrestrial ecosystems are institutionalized in education, monitoring and cross-sectoral and transboundary collaboration frameworks at the national and international levels?
	Indicator 1.1.2. Number of land use plans integrating environmental assessment processes that apply natural capital valuation	0	End of project Target: 6 Mid-Point Target: 2	Review of approved land use plan documents	Assumption 2 ?Challenging land tenure does not prevent integrated landscape management and the adoption of SLM and SFM technologies.?	

	<p>Indicator 1.1.3. Ratio of compliance with land use plan and integrated SEA & EIA provisions 1.1.3.a Compliance with stipulated land use as mandated by the land use plan 1.1.3.b Compliance with SEA & EIA provisions linked to the land use plan</p>	<p>0%</p>	<p>End of project Target: 80% (for both a and b) Mid-Point Target: 40% (for both a and b)</p>	<p>Review of infrastructure development applications; EIA screening lists; land use change monitoring by remote sensing</p>	<p>Assumption 1 ?The government maintains commitment towards integrated landscape management including SLM and SFM, improved environmental monitoring and enforcement, and internalizing the true value of natural capital in economic decisions.?</p>
<p>Corresponding Outputs:</p> <p>1.1.1. A review of policies, legislation, and procedures to integrate natural capital values and sustainable land management principles into land use planning is available to stakeholders.</p> <p>1.1.2. Stakeholders can access environmental assessment processes to feed into land use planning</p> <p>1.1.3. Conservation and Environment Protection Authority and other relevant central and provincial government agencies benefit from gender-responsive capacity and knowhow development to apply environmental assessment, compliance monitoring, and enforcement.</p> <p>1.1.4. Natural capital valuation reports with scenario analyses showing the value of biodiversity and its ecosystem goods and services in mountain landscapes are available to affected stakeholders.</p> <p>1.1.5. Affected stakeholders in mountain landscapes benefit from comprehensive land-use plans integrating the results of natural capital valuation with scenario analyses for different land-use options, and SLM and SFM principles.</p> <p>1.1.6. A stronger system for compliance monitoring and enforcement of multi-stakeholder land use planning and management systems is available to relevant authorities and provincial governments.</p>					

2.1. Mountain landscapes in the Southern Highlands and Hela Provinces managed sustainably by linking valuation of natural capital, land use planning and SLM/SFM with development policy and financial incentives to reduce degradation, move towards LDN and restore ecosystem services.	Indicator 2.1.1. Number of landowners and farmers disaggregated by sex reporting the adoption of SLM/SFM technologies promoted by the Project	0	End of project Target: 18,000 of whom 10,000 women Mid-Point Target: 7,500, of whom 4,000 women	Project monitoring database	Assumption 2 ?Challenging land tenure does not prevent integrated landscape management and the adoption of SLM and SFM technologies.?
	Indicator 2.1.2. Number of women reporting a net income rise of at least 10% as a result of adopting the Project's SLM/SFM technologies, or value chains	0	End of project Target: 2,000 women Mid-Point Target: 500 women	Survey among beneficiaries of Outputs 2.1.1, and 2.1.2, prior to midterm and prior to project end, capturing 10% of beneficiaries	Assumption 2 ?Challenging land tenure does not prevent integrated landscape management and the adoption of SLM and SFM technologies.?
	Indicator 2.1.3. Hectares of degraded agricultural land brought under SLM practices	0	End of project Target: 39,667 ha Mid-Point Target: 15,000 ha	GIS polygons demarcating land with SLM practices implemented	Assumption 2 ?Challenging land tenure does not prevent integrated landscape management and the adoption of SLM and SFM technologies.?
	Indicator 2.1.4 Hectares of degraded land brought under agroforestry practices	0	End of project Target: 21,528 ha Mid-Point Target: 8,000 ha	GIS polygons demarcating land with agroforestry practices implemented	Assumption 2 ?Challenging land tenure does not prevent integrated landscape management and the adoption of SLM and SFM technologies.?

<p>Indicator 2.1.5 Hectares of degraded forest land brought under SFM practices</p>	<p>0</p>	<p>End of project Target: 23,214 ha</p> <p>Mid-Point Target: 10,000 ha</p>	<p>GIS polygons demarcating forest land with SFM practices implemented</p>	<p>Assumption 2 ?Challenging land tenure does not prevent integrated landscape management and the adoption of SLM and SFM technologies.?</p>
<p>Indicator 2.1.6 Volume and outreach of sustainable financing mechanisms for LDN generated by the Project</p> <p>a) US\$ available for sustainable financing for LDN</p> <p>b)Number of private individuals and SMEs accessing sustainable financing for LDN</p>	<p>a) 0</p> <p>b)0</p>	<p>End of project Target:</p> <p>a) US\$ 500,000</p> <p>b)1,000</p> <p>Mid-Point Target:</p> <p>a) US\$ 150,000</p> <p>b)300</p>	<p>Records of financial contributions to offsetting mechanisms; records of financial disbursement in microcredit groups, to SMEs, for ex-ante carbon credits, for subsidies, and permit fees; financial records of tax easements, prices achieved for certification premium</p>	<p>Assumption 2 ?Challenging land tenure does not prevent integrated landscape management and the adoption of SLM and SFM technologies.?</p>
<p>Corresponding Outputs:</p> <p>2.1.1. SLM practices through restored soil fertility, improved income, and environmentally sound production demonstrated to landowners and farmers.</p> <p>2.1.2. Communities benefit from community-based restoration of degraded forests through SFM and agroforestry.</p> <p>2.1.3. Gender-sensitive strategies for SLM and SFM demonstrated at project sites to foster women's livelihood improvement.</p> <p>2.1.4. Stakeholders benefit from piloted sustainable financing mechanisms for LDN to incentivize land restoration.</p>				

3.1. Project results disseminated enabling scaling up and supporting land use planning, ecosystem good and services, and LDN	Indicator 3.1.1: Increased in use of capacities in practically applying SLM, SFM and the value of biodiversity in land use among targeted beneficiaries, disaggregated by sex	Baseline established during Inception Phase	End of project Target: 20% improvement against baseline for both f/m Mid-Point Target: 10% improvement against baseline for both f/m	Environmental KAP survey developed by CTA capturing a stratified random sample across age classes, gender, and socio-economic groups of 3% of the population of the targeted landscapes	n/a
	Indicator 3.1.2: Number of businesses integrating NCA in business planning and operations as a result of project intervention, disaggregated by sex of owner	0	End of project Target: 200 businesses (of which 120 owned by females) Mid-Point Target: 75 businesses	Project monitoring database: number of businesses with business plans incorporating NCA	Assumption 3 ?Market demand financially rewards businesses integrating natural capital valuation in their business plans.?
<p>Corresponding Outputs:</p> <p>Output 3.1.1. Effective results-based adaptive management and dissemination of results supported by participatory monitoring and evaluation system.</p> <p>Output 3.1.2. Stakeholders effectively absorb knowledge and best practices emerging from the project to implement SLM and SFM.</p> <p>Output 3.1.3. Small and medium sized and large enterprises are able to integrate natural capital valuation and SLM principles into feasibility plans and business models.</p> <p>Output 3.1.4. Landowners, communities and government institutions benefit from gender responsive capacity building on SLM and SFM in local languages.</p>					

ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

GEF Secretariat Comments

GEF Secretariat Comments	Responses
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<p>Please disaggregate the numbers for landowners and small farmers, so that we have clarity on the number of small farmers to benefit from improved SLM practices</p>	<p>Complex communal land tenure prevails in the Papua New Guinea Highlands, where individual private ownership and thus a clear distinction between landowners and small farmers is a rare exception. Any individual generally has access to land at multiple locations, by kinship with different clan lineages. Thus, any individual could have a wide choice of possible rights. Further, any individual or group could at any time grant another individual or group the right to use land. Land rights of management, ownership and alienation are often distinct from land user rights. A disaggregation by ?landowners? and ?small farmers? is therefore not feasible and sensible.</p>
<p>Given the challenges outlined regarding the SME and private sector, we expect further information at the CEO Endorsement stage on their ability to participate in pilot sustainable finance mechanisms. We also expect to see a criteria for selecting the SMEs that will be involved as well as the larger enterprises to be involved in the off-set mechanisms.</p>	<p>Most SMEs in the project landscapes are informal non-registered businesses. The project will support the registration of these SMEs as formal businesses (refer to Activity 3.1.3.1) as a precondition for being able to access financing. At the same time SMEs will be capacitated in financial literacy and business planning (also Activity 3.1.3.1) and supported in the preparation of business plans incorporating NCA (Activity 3.1.3.3) and supported in submitting of proposals for accessing funds from offset mechanisms on the condition on engaging on activities that contribute towards LDN (Activity 2.1.4.4). SMEs will be selected based on i) land-based activity within the landscapes targeted by the Project, ii) ownership by locals, preferentially by women or members of disadvantaged groups, iii) contribution to food security, iv) positive impacts on LDN and biodiversity conservation. The number of larger enterprises is limited and includes ExxonMobil, Oil Search and agro industries.</p>

<p>We expect further information on how the mechanisms that are being introduced will be institutionalized for enduring outcomes. These include the NCP processes, sustainable finance mechanisms, SLM and SFM approaches as well as the enforcement of all. For further guidance, please refer to STAPs paper on Achieving enduring outcomes from GEF investment http://stapgef.org/sites/default/files/publications/DURABILITY_web%20posting_2.pdf</p>	<p>The Project will introduce i) land use planning, ii) environmental assessment (SEA and NCA), iii) environmental compliance monitoring, iv) community-based forest management, v) sustainable financing for LDN as mechanisms. These will be institutionalized by i) establishing statutory committees for land use planning and linking them to existing institutions as well as mechanisms (e.g. District Development Plans) at the Provincial, District and LLG levels, ii) anchoring the formal requirement of environmental assessments in the legal and regulatory framework, iii) establishing a cross-sectoral standing committee for environmental compliance monitoring; vi) establishing and capacitating community-based organizations to implement community-based forest management and conservation under the existing legal framework of Conservation Deeds, v) channelling biodiversity offsetting through existing financial institutions, and securing markets for piloted PES (carbon forestry).</p>
<p>We expect a stakeholder engagement plan which captures all the key elements of engaging stakeholders. Please refer to guidance here https://www.thegef.org/sites/default/files/documents/Stakeholder_Engagement_Guidelines.pdf</p>	<p>We closely followed the GEF Stakeholder Engagement Guidelines in designing and defining the Project's Stakeholder Engagement Plan.</p>

<p>Regarding stakeholder engagement, please ensure that the farmers cooperatives and targeted SMEs are actively involved in project design and planning.</p>	<p>SMEs were intensively involved in project development. No farmers' cooperatives exist in the targeted provinces and landscapes. Agricultural cooperatives in PNG are associated with cash crops such as coconut, oil palm, cocoa, and coffee, of which only coffee is grown in small amounts in the landscapes, however without a cooperative structure. At the same time, numerous women's groups and youth groups work on land and natural resources in the targeted landscapes and they effectively function as production cooperatives. All of them were thoroughly consulted during the PPG.</p>
<p>We note the preparation of a comprehensive Gender Analysis at the CEO Endorsement Stage and we expect the inclusion of gender specific targets/indicators in the results framework.</p>	<p>We prepared a comprehensive Gender Analysis, Strategy and Action Plan (GAP) relying on close support by the UNEP Safeguards Team as well as the UNCCD Global Mechanism. This GAP specifies in detail gender-specific targets and gender-sensitive indicators that are included in the results framework.</p>
<p>Regarding collaboration with other projects, we expect more concrete information on areas of collaboration with the other GEF 7 projects.</p>	<p>The PPG Phases of GEF-10580 and GEF-10151 coincided and allowed a closely coordinated development of the two Projects, including the design of mutually reinforcing activities. For more detail, kindly refer to UNEP-GEF Project Document Section 2.7 'Linkages with other GEF and non-GEF interventions'. Similarly, the PPG Phase engaged with GEF-1</p>
<p>We note that the current overall project risk as low, however during the PPG stage please consider further ESS screening/assessments to assess any potential social risks and impacts.</p>	<p>A comprehensive ESS screening was completed during the PPG Phase with the active support of the UNEP Safeguards Advisor. The process resulted in upgrading the Project to the moderate risk category. For details, please refer to UNEP Project Document Section 3.11 'Environmental and Social Safeguards' and Appendix 15 'Safeguard Risk Identification Form'.</p>

GEF Council Comments

GEF Council Comments	Responses
<p>Climate change and variability and its impact on land use and agriculture is mentioned, however, there is still potential to strengthen the climate change element e.g. by including SLM and SFM technologies. Germany suggests better reflecting on how the project will consider climate change impacts in land use planning, SLM and SFM approaches and in Natural Capital Valuations (NCV), Strategic Environmental Assessments (SEA) and the Environmental Impact Assessments (EIA). Germany would also welcome explicit mention of how the project will contribute to building climate resilience.</p>	<p>The project activity plans include the preparation of climate and disaster vulnerability assessments (Activity 2.1.1.1), which will inform the detailed design of all field-based investments (SLM and SFM technologies). Furthermore, the climate risk assessment will inform scenario planning for land use plans and the NCA reports will assess potential changes in natural capital as a result of climate change. The Project's contributions to climate resilience are mentioned throughout the project activity plans.</p>
<p>A cost-benefit analysis component linked to land use planning that identifies economically feasible sites that have less impact on natural assets would be valuable. Germany suggests taking the Natural Capital Valuation component a step further to incorporate "cost-benefit analysis" which takes information from the NCV to guide land use planning.</p>	<p>We have included cost-benefit analyses demonstrating economic gains and losses under different land use scenarios as Activity 1.1.4.4. As basis for cost-benefit analyses, we have included economic valuation in the NCA component as Activity 1.1.3.3.</p>
<p>The current narrative on community governance is largely on commercial development. Governance to support SLM and SFM implementation, including addressing marginalised farmers/land users, land tenure arrangements and land security should be strengthened. Germany suggests addressing consensus building among landowners and land users, including women, and defining clear landowning boundaries, addressing governance issues at district and village level and giving information on how the project addresses the needs of marginalised farmers who are currently contributing to land degradation.</p>	<p>The project activity plan contains Activity 2.1.1.2 to allow for a structured and transparent engagement with communities ensuring FPIC and equitable benefit distribution. This activity will define local governance arrangements (apart from SFM which is subject of Activity 2.1.2.1) and define through an equitable selection process the list of local beneficiaries. In addition, the choice of activities to be implemented in the given community will be identified through consensus building through this activity.</p>
<p>The capacity building of trainers / extension staff / government staff on the "latest SLM and SFM practices and approaches" is not clearly articulated. Given that there is a need for capacity building of officers in this area, Germany would suggest to explicitly mention the capacity building of supporting agencies, including provincial/district extension officers on appropriate and innovative SLM and SFM approaches and on participatory land use planning tools.</p>	<p>The description of Activity 1.1.2.2 (ProDoc Section 3.3) clearly mentions the target group as recommended through the comment.</p>

<p>Regarding p. 25, para 2: The "conflicting land use interests" is not coming out very clearly. There needs to be stronger narrative on the various land use interest among the different sectors, including interests of the resource owners and users.</p>	<p>In the landscapes selected by the Project, conflicts arising from sectoral land use interests are subordinate. No active hydrocarbon extraction takes place, no active mining concessions are operated, and all land is under customary ownership. Large-scale production of cash crops by agro-industrial conglomerates does not take place within the landscapes. Of these cash crops, only coffee is produced by small-scale farmers on a very limited scale within the project landscapes. Potato (<i>Solanum tuberosum</i>) is the most important cash crop grown locally in large quantities, but this does not post a conflict with food self-sufficiency as potato that is not sold to the potato chip factories locally is eaten by the farmers.</p>
<p>Regarding section 4: Climate change adaptation information is weak. The proposed project intends to increase economic production through SLM so the baseline scenario for current economic activity needs to be reflected here. Germany suggests drawing information presented in pp. 21 and 24 and including the National Adaptation Plan to cover the adaptation elements.</p>	<p>The Project's climate change adaptation aspects and the baseline information have substantially been strengthened. Kindly refer to the section on climate change including its impacts of biodiversity and land use in ProDoc Section 2.1 (Background and context), 2.3 (The activity plans now</p>
<p>Regarding component 1 in section 5: The role of resource owners / farmers is missing. Germany suggests including suitable local community / resource owners' representatives for training/ engagement in NCA, SEA, EIA. Also, regarding page 29, para 3, the stakeholder engagement and consultation process on policies, legislations, plans, etc, appears to be focusing on the national level only and implies a top-down approach. Germany would welcome explicitly including a stakeholder engagement process that includes local communities and farmers, with regards to consultation process on national policies, plans and relevant regulatory frameworks.</p>	<p>All training components for local community members, landowners, and their institutions are included in Output 3.1.4 focusing on this target group. Component 1 (Output 1.1.1) identifies a highly participatory approach regarding the consultation on policies, legislation, and regulations at the provincial level. However, community-level consultations on national level policy and legal framework items throughout the country (outside the two targeted provinces) are clearly beyond the possibilities of the Project and consultations in 2 out of 22 provincial level entities would make little sense.</p>
<p>Regarding section 7: Climate resilience arising from SLM and SFM as a Project contribution can be mentioned. If the project does not go ahead then both human and ecosystem vulnerability to climate change increases and land degradation is exacerbated. Germany suggests including climate resilience components in terms of the project's contribution.</p>	<p>To address this comment, the Project activity plans include a Climate and Disaster Vulnerability Assessment (Activity 2.1.1.1) to inform the design of all field-based project activities and enhance the climate resilience arising of all SLM and SFM activities. This specific target has been mentioned in the Project Document.</p>

<p>Sustainability: Can be strengthened especially from the context of ownership and implementation of participatory land use plans. The engagement of all supporting agencies and landowners in the development, implementation and review of land use plans should be the basis for sustainability.</p>	<p>The design of the land use planning component focuses on the long-term sustainability of the process by establishing statutory committees responsible for land use planning at different levels. The approach foresees the participatory preparation of land use plans and their integration at higher administrative levels.</p>
<p>Gender: There is mention of women being very active in ?in selling produce and merchandised goods? but there does not appear to be any plans to advance this aside from ?training of young women entrepreneurs in computer skills, business management and basic accounting?. Germany suggests elaborating more on how women can be better engaged in the decision-making process, how the project can support rural women to successfully run SMEs and how women?s (independent) access to land can be addressed.</p>	<p>The Gender Analysis, Strategy and Action Plan provides a thorough analysis of women?s engagement in economic activities, as well as their participation in decision-making at various levels and identifies strategies to advance these. Building on this, the Project identified activities focusing on women?s economic empowerment (e.g. Activity 2.1.3.4 Develop gender-sensitive livelihood improvement programme, Activity 2.1.3.5 Develop sustainable land-based value chains, 2.1.4.3 Establish micro-credit groups to support the smallest female-owned land-based businesses, and 2.1.4.4 Disburse sustainable financing to SMEs on the condition of contributing to upscaling towards LDN).</p>
<p>Creating ownership: This is not coming out very strongly, particularly for ownership among local communities, resource owners and land users. A participatory land use plan is mentioned but the participatory process and the bottom-up consultation approach is not well articulated.</p>	<p>The project design addressed this comment by including a strong FPIC process that includes the participatory identification of local priority activities within the project framework as well as the participatory selection of beneficiaries based on clear equity criteria (Activity 2.1.1.3). Similarly, the detailed design of SLM (Activity 2.1.1.4) and SFM technologies (Activity 2.1.2.2), women?s livelihood development (Activity 2.1.3.4) all build on strong participatory processes. Addressing local priorities thereby will create ownership among local communities, resource owners and land users.</p>
<p>Synergies: GIZ Project in PNG related to this sector is ending in 2020 (CCCPIR ? focus on land use planning). Can have linkages to the Regional Pacific NDC Hub support via CCDA and the Regional REDD+ Project via PNGFA.</p>	<p>The linkages to the regional NCD Hub via CCDA and the regional REDD+ Project via PNGFA were included in the Project Document, Section 2.7 ?Linkages with other GEF and non-GEF interventions?.</p>

STAP Comments

STAP Comments	Responses
Outcomes	

<p>STAP recommends the project team consider the 3 different options for linking LDN tracking to the existing land administration system (explained in Table 4 of the LDN conceptual framework).</p>	<p>The Project operates at Level 2 of Linking LDN tracking to a country's land administration system and works on laying the foundations for Level 3. The project will deliver a systematic assessment of land and land use options based on land potential, current conditions, anticipated trajectory including due to climate change, socio-economic priorities and trade-offs resulting from scenario analysis applying expected shifts in natural capital values. The resulting scenarios will assess degradation risk associated with specific land use options, which will guide decisions documented in land use plans and the increase the accuracy of impact estimates.</p>
<p>Outputs</p>	
<p>STAP recommends that adaptive learning (as suggested in the LDN Conceptual framework); STAP also recommends the PPG contains a clear mapping of products and services against the expected outcomes; and that attention is paid to embedding the 'spatial' aspect in land use planning and in ecosystem-based management. Additionally, the land use planning needs to be highly participatory due to the customary land tenure system.</p>	<p>The PPG contains a clear mapping of products and services against the expected outcomes and outputs (refer to ProDoc Appendix 6: Key deliverables and benchmarks).</p>
<p>Baseline scenario</p>	
<p>STAP recommends the team design complementary national and sub-national indicators (in addition to the 3 core global indicators of LDN), appropriate for locally-relevant ecosystem services that are not covered by SOC, NPP or Land cover changes (see page 101 of the LDN Conceptual framework)</p>	<p>The results framework directly links up to the Project's contributions to GEBs at the level of impact indicators (e.g. Indicators 2, 3, 4, 5). Several outcome level indicators keep track of progress of locally relevant interventions and ecosystem services that represent causal links in the ToC that lead up to the impact indicators and thus the Project's GEB contributions (e.g. Indicators 2.1.1, 2.1.3, 2.1.4, 2.1.5).</p>
<p>Several of these projects provide technical assistance in biodiversity conservation, sustainable agriculture and natural resource management. Opportunities for linking these activities with the project will be sought, as well as opportunities for scaling biodiversity conservation and sustainable land management.</p>	<p>The PPG Phase engaged with several baseline projects (including 4 GEF projects) and identified clear coordination and collaboration needs and mechanisms with them. For details, please refer to UNEP-GEF ProDoc Section 2.7 'Linkages with other GEF and non-GEF interventions?.'</p>
<p>Proposed alternative scenario with a brief description of expected outcomes and components of the project</p>	

<p>STAP suggests developing a theory of change, a figure and accompanying narrative, during the project development to describe the causal logic and assumptions. A theory of change will assist in planning for LDN and biodiversity conservation interventions.</p>	<p>A ToC describing causal logic and assumptions has been developed in a participatory manner and is presented both in graphical presentation as well as in a narrative.</p>
<p>The project has clear outcomes and outputs, though it is weak in specifying ?how? and ?who? will develop what activities. This is of concern given the multiplicity of parallel projects with related scope that are cited in the baseline. Therefore, it will be valuable to use systems analysis to identify the cross-scale linkages and connections between actors (including parallel projects operating in the region), sectors (e.g. agriculture, mining, gas, social and economic sectors) as the theory of change is developed.</p>	<p>Though the PPG Phase did not apply a formal systems analysis approach, systems interlinkages were explored under broad stakeholder engagement during the theory-of-change exercises conducted during the three inception workshops (national, 2x provincial). These investigated social, environmental, economic and governance challenges across sectors in a systemic manner and mapped barriers and other limiting factors across scales, keeping in mind resilience, transformation and enduring impact. The contributions of stakeholders to the ToC are specified in the ToC narrative (ProDoc Section 3.4, para 132). The ?how? and ?who? factors of activities were specified in the project activity plans (ProDoc Section 3.3).</p>
<p>Yes ? the project identifies the possibility of climate hazards affecting the project. The project plans to develop climate mitigation measures during the project design.</p>	<p>The Project includes activities focusing on climate change risk assessment (Climate and Disaster Vulnerability Assessment ? Activity 2.1.1.1), climate change adaptation (Outputs 2.1 and 2.2), as well as on climate change mitigation (Activity 2.1.4.7).</p>
<p>5) incremental/additional cost reasoning and expected contributions from the baseline, the GEF trust fund, LDCF, SCCF, and co-financing</p>	
<p>Careful monitoring and a good theory of change and with careful institutional coordination and inter-agency coordination to avoid duplication of activities among the many contributions that are named in the baseline.</p>	<p>The ToC takes explicit reference of stakeholders, and the project design emphasizes on formal structures for institutional coordination. In addition, the project will closely liaise with two GEF projects that are thematically closely related and operate on the same temporal scale. As a result of coordinated PPGs, adjustments to the project results framework were made (e.g. changed focus of Output 3.1.4, given that GEF-10151 will take care of database development).</p>
<p>6) global environmental benefits (GEF trust fund)</p>	

<p>In component 1, STAP recommends using the LDN technical guidelines to assist with capturing natural capital values into landscape management.</p>	<p>The LDN Technical Guidelines were closely followed: The land use planning approach of the Project strongly links the assessment of natural capital and its values with landscape management by incorporating natural capital values in scenario and cost-benefit analyses that form the basis for land use planning decisions.</p>
<p>For mapping land use planning and monitoring LDN interventions, the project team may wish to refer to STAP's primer on remote sensing, which specifies how earth observation systems can complement qualitative research methods</p>	<p>The PPG phase applied Earth Observation platforms such as Trends.Earth, Global Forest Watch, EarthMap, and the UN Biodiversity Lab for data analysis and additionally engaged the University of PNG GIS Unit, as recommended in STAP's referenced guidance. The analyses of LDN and biodiversity indicators and were used to refine priority landscapes, delineate project boundaries and to refine estimates of expected global environmental benefits. The information obtained from Earth Observation platforms was additionally used to inform the assessment of the Project's environmental and social risks.</p>
<p>STAP is pleased with the project's restoration activities defined in component 2. To support with 'testing' of restoration techniques (e.g. contour bunds, mulching, conservation agriculture), and innovative techniques (e.g. agroforestry systems), STAP encourages the project team to identify assumptions and barriers (as well as enablers) to achieving short-outcomes (e.g. farmers adopt contour bunds) in the theory of change. Indicators should be assigned to the short-term outcomes to facilitate their monitoring.</p>	<p>The ToC contains an explicit driver (external factor under partial influence of the Project in UNEP terminology) that addresses the achievement of short-term outcomes: Driver 4 'Landowners buy into the piloting of SLM and SFM approaches and techniques involving their land.' In addition, the results framework identifies the requested indicator as Indicator 2.1.1. 'Number of landowners and farmers disaggregated by sex reporting the adoption of SLM/SFM technologies promoted by the Project'.</p>
<p>Furthermore, it will be valuable to link the theory of change with the monitoring and evaluation plans developed under component 3. This linkage will enable the dual monitoring of short-term outcomes with the global environmental outcomes (where change is slower and harder to detect) identified in section B. The project team is recommended to consult STAP's primer on the theory of change: https://www.stapgef.org/theory-change-primer</p>	<p>The ToC and the M&E plans are explicitly linked through Activity 3.1.1.1.1. At the same time, short-term monitoring and monitoring of long-term impacts are explicitly linked in the ToC.</p>
<p>STAP also recommends linking the project's knowledge with WOCAT's global database on sustainable land management: https://www.wocat.net/en/global-slm-database</p>	<p>Key lessons learnt from the project will be disseminated through national and international platforms, including the WOCAT database (refer to Activity 3.1.2.1).</p>
<p>Is the scale of projected benefits both plausible and compelling in relation to the proposed investment? Unclear. Suggest identifying the barriers and enablers to scaling in the theory of change.</p>	<p>The ToC narrative and graphical presentation both explicitly identify a number of assumptions and drivers that act at different levels to influence scaling to higher-level results.</p>

<p>Indicators will be provided in the final project document. In addition to listing the GEF core indicators related to biodiversity conservation and sustainable land management, STAP suggests identifying indicators to monitor and track progress of the causal links in the theory of change. As aforementioned, STAP encourages the project team to identify indicators appropriate for locally-relevant ecosystem services that are not covered by SOC, NPP or land cover changes (see page 101 of the LDN Conceptual framework).</p>	<p>The results framework directly links up to the Project's contributions to GEBs at the level of impact indicators (e.g. Indicators 2, 3, 4, 5). Several outcome level indicators keep track of progress of locally relevant interventions that represent causal links in the ToC that lead up to the impact indicators and thus the Project's GEB contributions (e.g. Indicators 2.1.1, 2.1.3, 2.1.4, 2.1.5).</p>
<p>What activities will be implemented to increase the project's resilience to climate change? The project plans to put in place contingency measures, including multiple scenarios, to deal with the adverse impacts of climate change.</p>	<p>The project activity plans contain Activity 2.1.1.1 ?Conduct a climate and disaster vulnerability assessment?. As explicitly mentioned throughout the activity plan description, both the design and implementation of SLM and SFM activities will be informed by the climate vulnerability assessment, which will directly lead to increased climate resilience.</p> <p>Contingency measures are put in place as part of the land use planning process, that includes scenario planning to deal with multiple scenarios, including for the adverse impacts of climate change.</p>
<p>7) innovative, sustainability and potential for scaling-up</p>	
<p>The assumption is that these /the Project activities/ efforts, combined with capacity building for these technologies and approaches, will generate the knowledge and institutional conditions to scale across temporal and spatial scales. STAP recommends its paper on durability and theory of change - where it lists principles that need attention to achieve scaling</p>	<p>The referenced STAP paper was fully considered, including by developing a solid ToC based on a participatory systemic analysis, by including an Activity to continuously review and adjust the ToC (Activity 3.1.1.11), a reasonably adaptive project design to changing conditions, by considering all relevant external changes listed on page 13 of the referenced guidance in the ToC. In addition, project design appropriately accounted for key lessons on transformation, including by i) focusing on demonstrating pilots that lead to knowledge and experience, ii) focus on building rules and institutions, and iii) proper alignment to wider cultural norms and values to allow scaling. Furthermore, the PPG applied a multi-stakeholder design process, including cyclic stakeholder mapping and analysis, and equitable stakeholder engagement. The Project contains community and institutional capacity building programs and includes a strong participatory monitoring and adaptive management framework that relies on the appropriate knowledge management.</p>

<p>Will incremental adaptation be required, or more fundamental transformational change to achieve long term sustainability?</p> <p>It is possible that both adaptation and transformational change will be required due to climate stressors and risks, such as flooding and droughts which the target areas are susceptible to being impacted. STAP encourages the project team to consider uncertainty to cope with the level of change that may take place. This requires considering systematically time scales and spatial scales when planning the interventions. The theory of change can do this if it is designed to assess how the targeted social-ecological system functions across scales. Refer to STAP's theory of change primer.</p>	<p>Both incremental adaptation and transformational change will be required to secure the long-term sustainability of project results. The project will apply incremental adaptation by building on local knowledge which will be sufficient to increase resilience against minor stressors. However, major risks associated with flooding, etc. will require transformational change. The theory of change reflects transformational change in all three components, however primarily under Component 3 and 1. Integrated land use planning that integrates environmental assessment processes, is governed by cross-sectoral platforms along with the enabling policy and institutional environment allowing this represents transformational change.</p>
<p>1b. Project Map and Coordinates. Please provide geo-referenced information and map where the project interventions will take place.</p>	
<p>A map of Papua New Guinea's socio-economic development is provided. Suggest providing the coordinates for the project sites in the final project document, as well as land uses. STAP's guidance on earth observation systems can assist during project preparation in delineating boundaries and learning how to use data (e.g. land use cover) for LDN monitoring</p>	<p>The Project Document in Section 2.1 contains several maps that present land use / land cover as well as biodiversity and land degradation indicators and features. The coordinates are provided in GEF CEO ER Annex E below. For details on the extensive use of earth observation during the PPG and implementation phases refer to our response under 6. Global Environmental Benefits further up.</p>
<p>2. Stakeholders</p>	
<p>Some key stakeholders have been identified while others will be defined once a stakeholder mapping takes place. Stakeholders' roles and responsibilities in relation to achieving the global environmental outcomes will be provided in the final project document.</p> <p>STAP notes the extensive experience of Australia with the setting of biodiversity offset mechanisms (one way the project proposes to offset impacts of development mechanisms). The PPG team is strongly encouraged to learn from that experience and transfer and adapt to the PNG context.</p>	<p>Stakeholders were mapped in a cyclic manner throughout the PPG Phase and their roles and responsibilities were negotiated in bilateral and multilateral consultations, the results of which are documented in the ProDoc Sections 2.5 Stakeholder mapping and analysis, Section 4 Institutional framework and implementation arrangements, and Appendix 5 Workplan and schedule.</p> <p>The Project applies the Draft policy framework for PNG National Biodiversity Offsets Policy 2020 that was prepared by an Australian consultant company to guide the biodiversity offsetting mechanism under the Project.</p>
<p>3. Gender Equality and Women's Empowerment</p>	

<p>During the process of assessing gender issues, STAP recommends considering whether the full participation of an important stakeholder group is hindered as a result and describing how will the project address these obstacles.</p> <p>STAP recommends due consideration of these publications /publications listed/</p>	<p>The PPG could access all important stakeholder groups to assess gender issues. Hela and Southern Highlands Provinces have substantial female leadership including in relevant administrative positions, who were accessed during the PPG. The two publications, particularly the 'Manual for Gender-Responsive Land Degradation Neutrality Transformative Projects and Programmes' were closely followed in developing the Project's Gender Analysis, Strategy and Action Plan and in designing the project's gender activities. In addition, the PPG was supported by the UNCCD Global Mechanism in ensuring gender-responsive project design.</p>
<p>5. Risks.</p>	
<p>In addition to the climate risks identified in the PIF, STAP recommends addressing the climate resilience measures described to the left /climate impacts on project objectives and outputs; assessment of sensitivity to climate change; consideration of resilience and climate risk management; required capacities to address climate risks/. STAP also encourages the project developers to continually test causal links, assumptions, and risks in the theory of change. This process will enable the project team to assess for the resilience of the system ? identify how, and where, the system is weak, or strong, in its capacity to deal with disturbances.</p>	<p>The PPG phase conducted a detailed screening for climate change risks, documented in the UNEP Safeguards Risk Assessment Framework, under Safeguard Standard 2: Climate Change and Disaster Risks (ProDoc Appendix 15), as well as the current and projected range of climate vulnerabilities described in the project context (ProDoc Section 2.1). The ToC also takes explicit account of climate risks through the identification of Driver 3 'Effective adaptation to climate change ensures the resilience of project investments.' Additionally, the described climate resilience measures were considered, including by mainstreaming climate change in the development of the Capacity Development Strategy and Plan (Activity 1.1.2.1). In addition, the on-going monitoring of the ToC and of climate change risks and mitigating measures, as prescribed in Activity 3.1.1.11: 'Conduct annual implementation review of ? social and environmental safeguards, climate change risks and mitigation measures, and assumptions underlying the Project's Theory of Change?.'</p>
<p>8 Knowledge management</p>	

The monitoring component will be used to generate knowledge. STAP recommends considering knowledge management metrics, and specifying how the knowledge generated will influence scaling of results. In addition, it would be valuable to link the knowledge strategy to the theory of change.

The project results framework includes Indicator 3.1.1 ?Increased in use of capacities in practically applying SLM, SFM and the value of biodiversity in land use among targeted beneficiaries, disaggregated by sex? to be measured through KAP surveys.

Knowledge was described throughout the ToC (graphical and narrative presentation ? ProDoc Section 3.4), including at the level of root causes, barriers, outputs, and outcomes, and in the narrative describing stakeholders? contributions to the ToC through the use of knowledge.

ANNEX C: Status of Utilization of Project Preparation Grant (PPG).
(Provide detailed funding amount of the PPG activities financing status
in the table below:

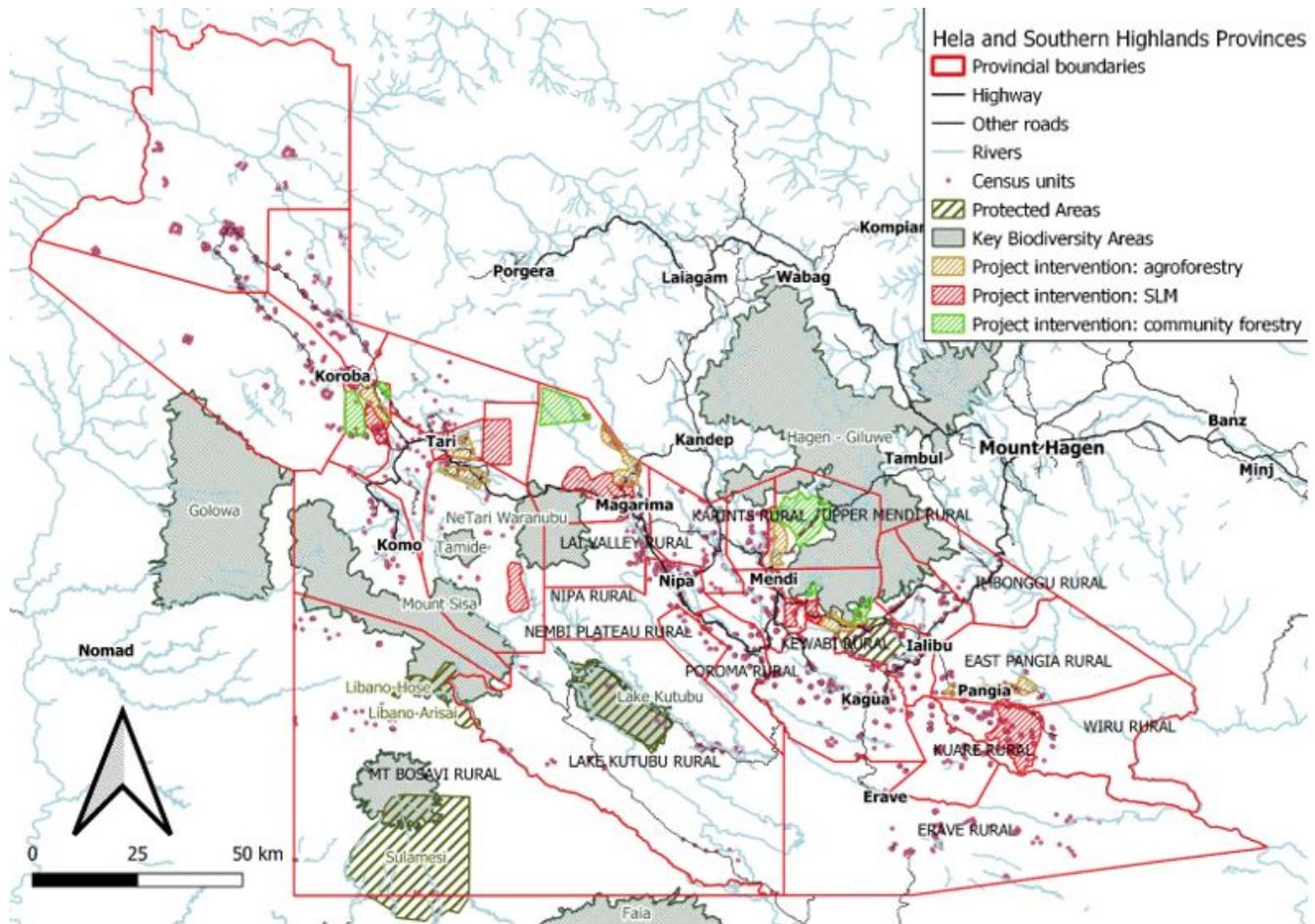
PPG Grant Approved at PIF: US\$ 150,000			
<i>Project Preparation Activities Implemented</i>	<i>GETF/LDCF/SCCF Amount (\$)</i>		
	<i>Budgeted Amount</i>	<i>Amount Spent to Date</i>	<i>Amount Committed</i>
Personnel component			
Project Design Expert/Team Leader	70,000	7,000	63,000
National Expert Land Use	25,000	0 (in process)	25,000
National Expert Biodiversity	25,000	0 (in process)	25,000
Training component			
Inception and final validation workshops	15,000	10,000	5,000
Stakeholder consultations and surveys	15,000	10,000	5,000
Total**	150,000	27,000	123,000

* Four workshops were held during the PPG: National Inception Workshop (7 July 2021), 2 Provincial Inception Workshops (19 and 22 July 2021) and Final Validation Workshop (23 September 2021).

ANNEX D: Project Map(s) and Coordinates

Please attach the geographical location of the project area, if possible.

Project interventions will take place in project landscapes across Hela and Southern Highlands Provinces, both located in the Highlands Region of Papua New Guinea within the geographic coordinates of 4°58'12" S to 6°51'39" S, and 142°3'58" E to 144°41'4" E. The location of Project intervention landscapes is presented by intervention type in the map below.



ANNEX E: Project Budget Table

Please attach a project budget table.

ANNEX F: (For NGI only) Termsheet

Instructions. Please submit a finalized termsheet in this section. The NGI Program Call for Proposals provided a template in Annex A of the Call for Proposals that can be used by the Agency. Agencies can use their own termsheets but must add sections on Currency Risk, Co-financing Ratio and Financial Additionality as defined in the template provided in Annex A of the Call for proposals. Termsheets submitted at CEO endorsement stage should include final terms and conditions of the financing.

ANNEX G: (For NGI only) Reflows

Instructions. Please submit a reflows table as provided in Annex B of the NGI Program Call for Proposals and the Trustee excel sheet for reflows (as provided by the Secretariat or the Trustee) in the Document Section of the CEO endorsement. The Agencies is

required to quantify any expected financial return/gains/interests earned on non-grant instruments that will be transferred to the GEF Trust Fund as noted in the Guidelines on the Project and Program Cycle Policy. Partner Agencies will be required to comply with the reflows procedures established in their respective Financial Procedures Agreement with the GEF Trustee. Agencies are welcomed to provide assumptions that explain expected financial reflow schedules.

ANNEX H: (For NGI only) Agency Capacity to generate reflows

Instructions. The GEF Agency submitting the CEO endorsement request is required to respond to any questions raised as part of the PIF review process that required clarifications on the Agency Capacity to manage reflows. This Annex seeks to demonstrate Agencies' capacity and eligibility to administer NGI resources as established in the Guidelines on the Project and Program Cycle Policy, GEF/C.52/Inf.06/Rev.01, June 9, 2017 (Annex 5).