



BANK OF PAPUA NEW GUINEA

# Inclusive Green Finance Policy of Papua New Guinea 2023



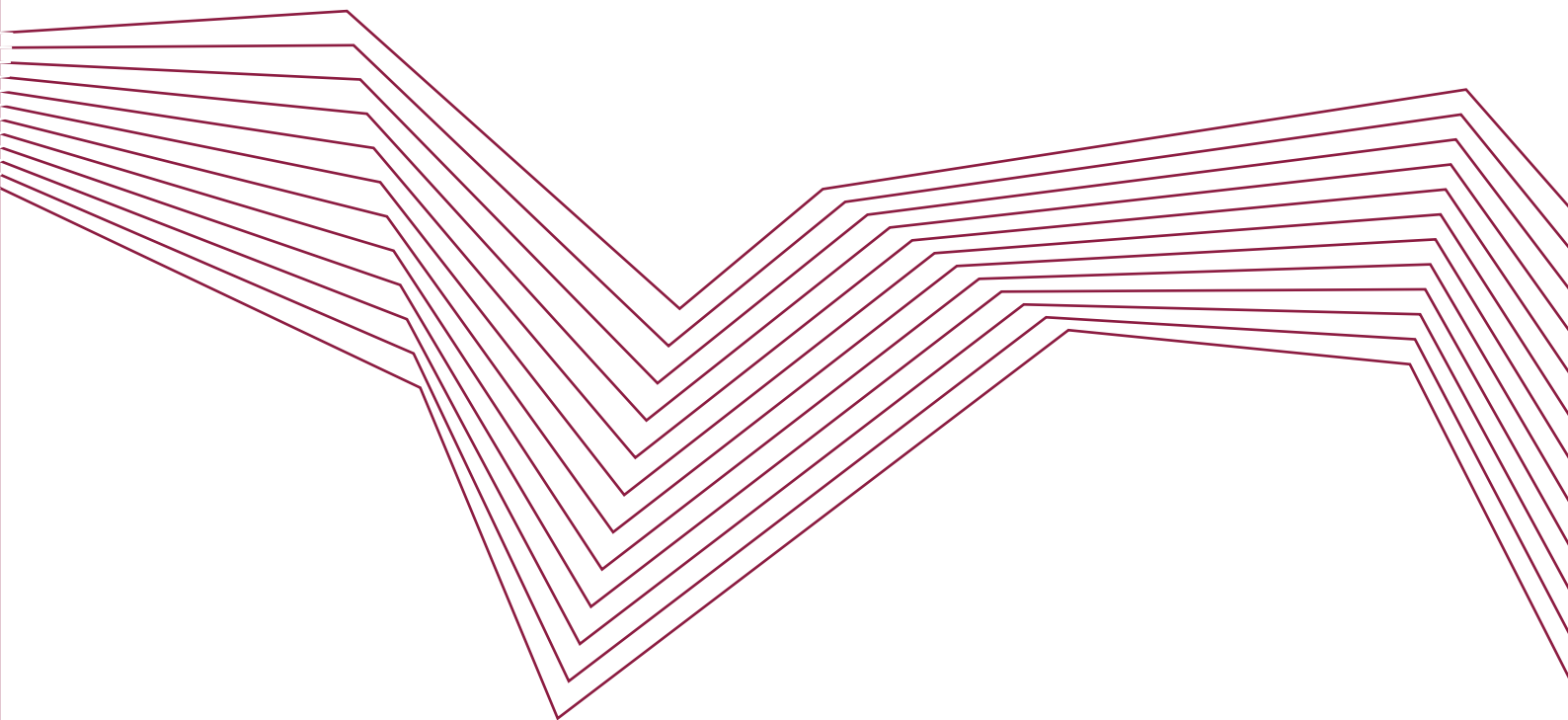


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# **Inclusive Green Finance Policy of Papua New Guinea 2023**



## Steering Committee:



BANK OF PAPUA NEW GUINEA



Climate Change and Development Authority



NEW ZEALAND  
FOREIGN AFFAIRS & TRADE  
Aid Programme



## Funded and supported by:



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## Foreword



We have seen, in recent years, a growing emphasis on sustainability, resilience, and inclusiveness in almost every aspect of how a society is run. One would not be wrong to state that these values (or ideas) have become truly mainstream worldwide. They appear in policy discussions and official gazettes regardless of a country's level of development; even the poorest nations now have some version of a national strategy, roadmap, or workplan on one or more of the aforementioned areas.

Of course, drafting a strategy is one thing, and implementing it is another. Implementing, for example, a project that contributes to the government's strategic goal – whether it is climate change mitigation or fostering the development of women entrepreneurs – requires an effective combination of human and financial resources. For developing countries, in particular, the latter can rarely be provided solely from the treasury; there is a long list of competing needs (e.g., building roads and bridges, salary for teachers, funding rural hospitals, etc.) and the budget is never sufficient.

It is perhaps this recognition – of the inadequacy of public resources to address society's challenges – which led to an array of policies being developed to regulate the financial sector. The general argument seems to be that, by shifting the incentives of financial institutions and helping them change their behavior, more financing would flow to sustainable, climate resilient, gender inclusive, and green activities. There seems to be no shortage of reports on how transforming the financial sector will lead to “leveraging” (or “catalyzing”) private capital at scale.

We at the Bank of Papua New Guinea are mindful of these developments, and when we decided to develop the Inclusive Green Finance Policy (which includes the Inclusive and Green Taxonomy), it was based on two salient considerations. The first pertains to our role as a regulator of the financial industry. We are of the view that financial institutions do have a role to play in furthering the sustainable development of Papua New Guinea (PNG) and addressing climate change, starting with a better understanding of how these terms are operationalized in the government's various sectoral plans. For example, a commercial bank that is keenly aware of the government's roadmap regarding electric vehicles, the general distribution and capacity of firms seeking to enter this space, and donor-funded projects to promote technology transfer or joint ventures, will be in a much better position to identify competent borrowers than a bank that assumes a more passive role. We would therefore like to encourage such behavior, and the taxonomy serves as a good starting point for bank officials to identify what is green and/or inclusive in PNG's context.

Second, we are cognizant of the business model of financial institutions and the challenges associated with lending to a novel sector or firm, no matter how green or inclusive it may be.

Part of the challenge has to do with a lack of data (given the novelty), but most of it – as we have learned through this project – is caused by systematic issues such as policy gaps, low institutional capacity, and inefficient practices. The Inclusive Green Finance Policy will bring these and other issues into sharp relief when policymakers delve into reasons why the volume of inclusive and/or green loans is not growing as fast as they hoped. Hopefully, shedding light on such non-financial barriers would spur prompt action from those with the authority to address them.

The Inclusive Green Finance Policy was developed against this backdrop, and I would be the first to admit that the policy is by no means perfect. The drafting process, originally intended to be a collaborative effort with government agencies and financial institutions, turned into a protracted awareness-raising campaign as to what a taxonomy is, what its goals are, and why it is needed. As a result, much of the technical input we hoped to obtain fell short of what was needed, but the final product is valuable nonetheless as the first and important step. We knew from the beginning that this would be a marathon, not a sprint, and as subsequent editions of the taxonomy are published with support from the Green Finance Centre, it will better reflect the evolving structure of PNG's economy and what green and inclusive means within it. We look forward to being part of the journey, and I hope you will actively contribute to the effort for the financial sector to do our part in PNG's development.

**Mrs. Elizabeth Genia, AAICD**  
**Acting Governor**  
**Bank of Papua New Guinea**



## About the *Inclusive Green Finance Policy Project*

The Inclusive Green Finance Policy project (IGFP) was launched in June 2021 with the goal of supporting Papua New Guinea's (PNG) financial sector transition into one that is more inclusive, sustainable, and resilient. There is a growing global consensus that financial institutions have an important role to play in addressing major social and environmental challenges such as climate change; the IGFP project was conceived against this backdrop and represents one of the first steps taken by the Bank of Papua New Guinea (BPNG) and other stakeholders to accelerate the transition of PNG's financial sector.

The IGFP project's main output is the Inclusive and Green Taxonomy (taxonomy). In addition, there are two accompanying documents:

- A Diagnostic Report was prepared to provide a comprehensive review of relevant policies, strategies, and roadmaps issued by the PNG government as well as salient barriers hindering their implementation, and
- An Implementation Roadmap was developed to present a detailed list of activities that BPNG, financial institutions, and government agencies could undertake to create an enabling environment for effective application of the taxonomy.

The project was led by a Steering Committee composed of BPNG (Chair), Department of Treasury, Climate Change and Development Authority, Centre for Excellence in Financial Inclusion, Alliance for Financial Inclusion, Global Green Growth Institute, and the New Zealand Ministry of Foreign Affairs and Trade. A Technical Working Group composed of government agencies, financial institutions, non-governmental organizations, international organizations, industry associations, and academia offered valuable input based on their respective points of view. All project activities were funded with generous support from the New Zealand Ministry of Foreign Affairs and Trade.



## Acknowledgements

PNG's taxonomy is a list of goods, services, activities, and projects that contribute to the achievement of one or more sustainability-related goals set by the government of PNG. Therefore, input from policymakers, technical specialists, industry professionals, and other subject matter experts was essential for preparing the list as well as the technical screening criteria. The project team also relied extensively on feedback from PNG's financial institutions – in particular, their views regarding the feasibility of applying the taxonomy to their day-to-day operations were invaluable in drafting the Implementation Roadmap.

The project team is immensely grateful to the many individuals who kindly devoted their time and effort to participate in interviews, attending workshops, and reviewing numerous revisions to the taxonomy. We would like to give our very special thanks to these representatives of the following organizations:

- Bank South Pacific
- Kina Bank
- MiBank
- Mama Bank (Women's Micro Bank)
- SME Corporation
- Federation of Savings and Loan Societies
- Conservation and Environment Protection Authority
- Tourism Promotion Authority
- Investment Promotion Authority
- National Energy Authority
- PNG Forest Authority
- PNG National Weather Services
- Department of Agriculture and Livestock
- Department for Community Development and Religion
- Department of National Planning and Monitoring
- Department of Transport
- University of Papua New Guinea
- National Agriculture Research Institute
- International Finance Corporation
- United Nations Development Programme
- World Wildlife Fund
- World Vision
- Solar Energy Association of PNG
- Emstret Holdings Ltd
- The Voice Inc



## Abbreviations

ADB	Asian Development Bank
AFC	Agriculture and Finance Consultants GmbH
AFOLU	Agricultural, Forestry and Other Land Use
ANZ	Australia and New Zealand Banking Group Limited
ASEAN	Association of Southeast Asian Nations
ATM	Automated Teller Machine
BPNG	Bank of Papua New Guinea
BREEAM	Building Research Establishment Environmental Assessment Method
BSP	Bank South Pacific
CBB	Coffee berry borer
CBO	Community Business Opportunities
CCDA	Climate Change and Development Authority
CCI	Cocoa Coconut Institute
CEFI	Centre for Excellence in Financial Inclusion
CEPA	Conservation and Environment Protection Authority
CIC	Coffee Industry Corporation
CRED	Centre for Research on the Epidemiology of Disasters
CRI	Coffee Research Institute
CSR	Corporate Social Responsibility
DAL	Department of Agriculture and Livestock
DNPM	Department of National Planning and Monitoring
DNSH	Does not significantly harm
DPLGA	Department of Provincial and Local-level Government Affairs
EBRD	European Bank for Reconstruction and Development
EE	Energy efficiency
ESDD	Environmental and social due diligence
ESG	Environmental, social, and governance
ESMS	Environmental and social management system
EU	European Union
FAO	Food and Agriculture Organization
FI	Financial Institution
FPDA	Fresh Produce Development Agency
FX	Foreign exchange
GAP	Good Agricultural Practices
GAR	Green Asset Ratio
GDP	Gross Domestic Product
GFC	Green Finance Centre
GFDRR	Global Facility for Disaster Reduction and Recovery
GHG	Greenhouse Gas
GII	Gender Inequality Index
GSTC	Global Sustainable Tourism Council
HDI	Human Development Index
HH	Households
ICT	Information communications technology
IFC	International Finance Corporation
IGF	Inclusive and Green Finance
IGFP	Inclusive and Green Finance Policy
IPCC	Intergovernmental Panel on Climate Change
IPSF	International Platform on Sustainable Finance
KATS	Kina Automated Transfer System
KIK	Kokonasi Industri Korporensen

KPI	Key Performance Indicator
LDC	Least Developed Country
LEED	Leadership in Energy and Environmental Design
LNG	Liquid Natural Gas
MEBA	Microfinance for Ecosystem-based Adaptation
MFI	Microfinance Institution
MIS	Management Information System
MSC	Marine Stewardship Council
MSME	Micro, small, and medium-sized enterprises
MVF	Market for Village Farmers Project
NADP	National Agriculture Development Plan 2007-2016
NAP	National Adaptation Plan
NAQIA	National Agriculture Quarantine and Inspection Authority
NARI	National Agricultural Research Institute
NBPOL	New Britain Palm Oil Limited
NCD	National Capital District
NCDC	National Capital District Commission
NDB	National Development Bank
NDC	Nationally Determined Contributions
NEA	National Energy Authority
NFA	National Fisheries Authority
NGFS	Network for Greening the Financial System
NGO	Non-governmental organization
NICTA	National ICT Authority of Papua New Guinea
NPL	Non-performing loan
OKR	Objectives and key results
OPIC	Oil Palm Industry Corporation
PAS	Publicly available specification
PGK	Papua New Guinea Kina
PNG	Papua New Guinea
PNGDSP	Papua New Guinea Development Strategic Plan
PNGFA	Papua New Guinea Forest Authority
PNGTPA	Papua New Guinea Tourism Promotion Authority
RE	Renewable energy
REDD	Reducing emissions from deforestation and forest degradation
RINA	Registro Italiano Navale
SBFN	Sustainable Banking and Finance Network
SC	Steering Committee
SME	Small and medium-sized enterprises
TBC	To be confirmed
TBD	To be determined
TEG	Technical Expert Group
TSC	Technical Screening Criteria
TSR	Technically Specific Rubber
TWG	Technical Working Group
UDDT	Urine-Diverting Dry Toilet
UNDP	United Nations Development Programme
VC	Venture Capital
WEEE	Waste Electrical and Electronic Equipment Recycling



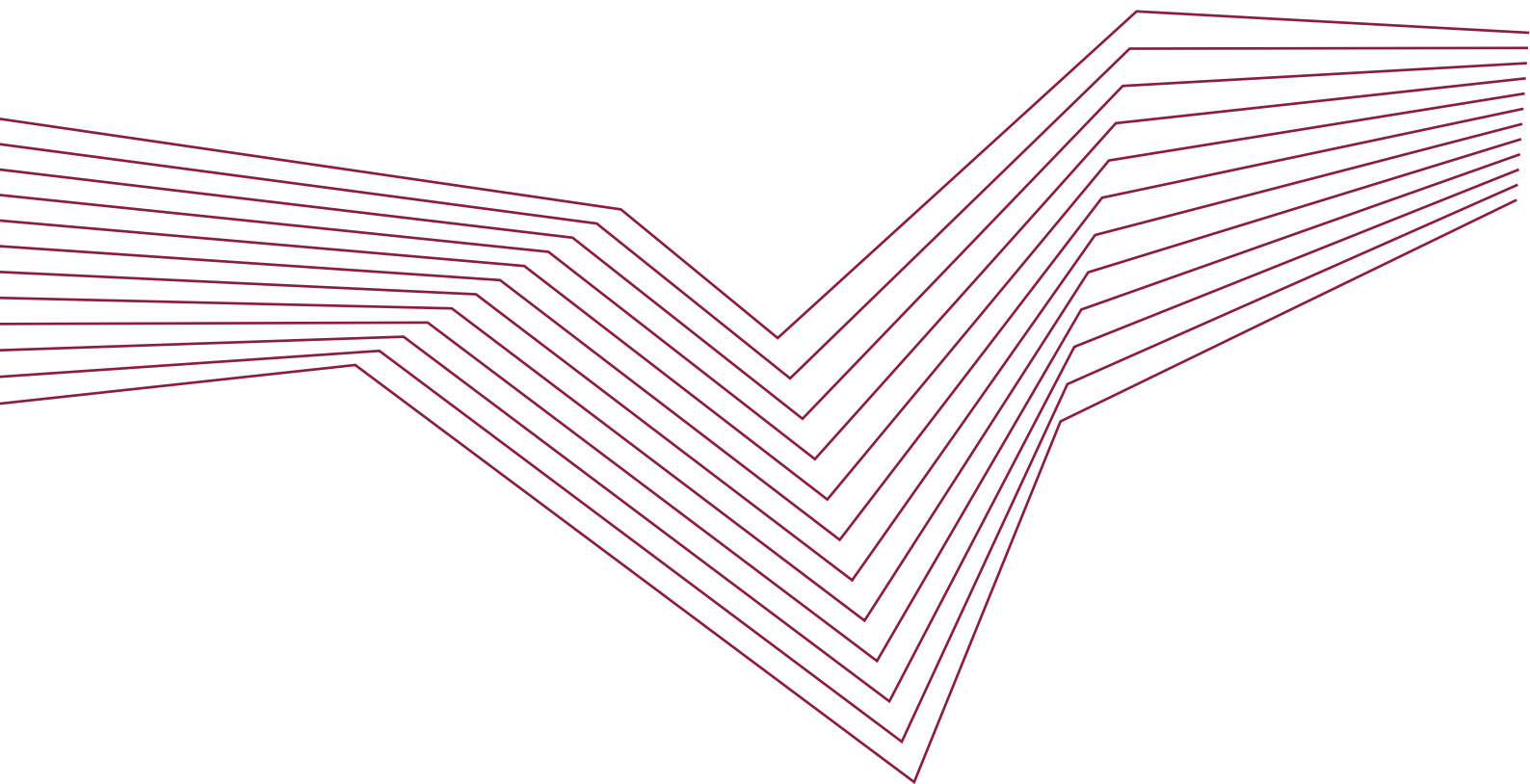
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# Inclusive Green Finance Policy

**Part 1. Inclusive and Green Taxonomy**

**Part 2. Diagnostic Report on the State of Inclusive and Green Finance in  
Papua New Guinea**

**Part 3. Implementation Roadmap**



# Inclusive and Green Taxonomy of Papua New Guinea







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# 1. Inclusive and Green Taxonomy of Papua New Guinea

## 1.1. Introduction

The Green and Inclusive Taxonomy of Papua New Guinea (hereafter referred to as the “taxonomy”) is designed for investors, lenders, and other financial sector participants to identify, monitor, and demonstrate – through quantitative metrics – the scope and volume of their inclusive and green financial flows, whether it is in the form of a loan, equity, guarantee, or some other financial instrument.

The term “inclusive and green finance” here refers to public and private funds earmarked to support the transition to a low carbon, inclusive, and climate-resilient economy. One of the key steps to mobilizing inclusive and green finance at scale is a consistent, transparent, and practical definition of what constitutes a green and/or inclusive activity. A comprehensive list of such definitions is referred to as an inclusive and green classification system or taxonomy, and it is key to operationalizing the transition to a low carbon, inclusive, and climate-resilient economy.

Specific examples of the taxonomy’s uses include:

- Providing financial institutions, businesses, citizens, policymakers, and other stakeholders with a common understanding of and a system to identify, develop, and finance inclusive and green activities.
- Fostering credible and standardized Sustainability Disclosure Requirements and mitigating the risk of “greenwashing”.
- Boosting inclusive and green finance flows from various sources, including the domestic private sector, international financial institutions, and foreign investors.
- Tracking private sector investments and loans in inclusive and/or green projects and measuring the impact on PNG’s inclusive and green development and climate change related policies and targets.
- Minimizing the challenges in identifying and implementing an evaluation framework/system to assess whether economic activities and enterprises are promoting initiatives to reduce carbon emissions.
- Supporting PNG in meeting its climate mitigation and adaptation goals – for example, tracking the volume of climate finance that contributes to the achievement of its Nationally Determined Contribution (NDC).
- Providing the financial sector with clarity and certainty in selecting green and/or inclusive investments in line with international best practices and PNG’s national priorities, policies, and standards.
- Attracting additional foreign capital for climate-friendly and inclusive/green investment in PNG by increasing the credibility and transparency of green activities.
- Facilitating the reporting and management of environmental and social performance, thereby contributing to the reduction of financial, climate, and systemic risks.
- Supporting regulatory and supervisory oversight of the financial sector.
- Reducing the costs associated with labeling and issuing a green financial instrument.



## 1.2. Development of the Taxonomy

### 1.2.1. Governance

The taxonomy's development was overseen by a Steering Committee and supported by a Technical Working Group, a cross-sectoral group of policymakers, technical specialists, industry professionals, and other subject matter experts from the national government, financial sector, NGOs, and businesses. Support and funding for the taxonomy's development were provided by the New Zealand Ministry of Foreign Affairs and Trade.

#### Members of the Steering Committee

- Bank of Papua New Guinea (Chair)
- Department of Treasury
- Centre for Excellence in Financial Inclusion
- Climate Change and Development Authority
- Alliance for Financial Inclusion
- Global Green Growth Institute
- New Zealand Ministry of Foreign Affairs and Trade

#### Members of the Technical Working Group

- Bank South Pacific
- Kina Bank
- MiBank
- Mama Bank (Women's Micro Bank)
- SME Corporation
- Federation of Savings and Loan Societies
- Conservation and Environment Protection Authority
- Tourism Promotion Authority
- Investment Promotion Authority
- National Energy Authority
- PNG Forest Authority
- PNG National Weather Services
- Department of Agriculture and Livestock
- Department for Community Development and Religion
- Department of National Planning and Monitoring
- Department of Transport
- University of Papua New Guinea
- National Agriculture Research Institute
- International Finance Corporation
- United Nations Development Programme
- World Wildlife Fund
- World Vision
- Solar Energy Association of PNG
- Emstret Holdings Ltd
- The Voice Inc

## 1.2.2. Process

The project launched in June 2021 and the first interim output, an Inception Report summarizing all relevant government policies, strategies, roadmaps, and workplans, as well as a tentative structure of the taxonomy (based on objectives and principles described below), were presented to the Steering Committee. This was followed by extensive stakeholder consultations – a combination of conferences and one-on-one interviews – between October 2021 and June 2022, including a pilot application of the taxonomy to a microfinance institution to better understand the technical and capacity-related barriers. After several rounds of revisions based on input from the Steering Committee and the Technical Working Group, the taxonomy was released to the public in August 2022 for comments.

## 1.2.3. Objectives and Principles

The taxonomy's development was guided by the following six objectives:

- Climate change mitigation
- Climate change adaptation and resilience
- Sustainable use and protection of water and marine resources
- Pollution prevention and control
- Conservation and resource efficiency
- Protection and recovery of biodiversity and ecosystems

For economic activity to be considered environmentally sustainable, it must comply with all four of the following criteria:

- Substantially contributes to one or more environmental objectives
- Does not significantly harm (DNSH) any environmental objective
- Complies with minimum safeguards based on certain human rights standards
- Complies with the technical screening criteria, which are the detailed conditions for the first two criteria above

The following principles were also considered and followed while drafting the IGFP:

- Principle 1: Contribute to national policies and targets
  - ▶ The taxonomy should contribute to the key inclusive and/or environmental targets in PNG's policies, strategies, programs, and the subsequent revisions to the taxonomy should respect PNG's sustainable development priorities.
- Principle 2: Address and make a significant contribution(s) to addressing environmental challenges and promoting inclusive growth
  - ▶ PNG's key environmental and climate risk challenges should be addressed while ensuring the inclusion of marginalized groups in the country's economic growth.
- Principle 3: Cover priority economic sectors
  - ▶ The taxonomy should cover the identified priority NAP sectors and contribute to the transition of key economic sectors into sustainable ones.
- Principle 4: Align with international standards and good practices
  - ▶ The taxonomy should reference and align with compatible international standards and practices.
- Principle 5: Comply with ESG standards
  - ▶ The taxonomy must comply with minimum international environmental, social, governance, and risk management regulations and standards.
- Principle 6: Iterative, dynamic, and continuous review and development
  - ▶ The taxonomy will require continuous review and updates based on policy shifts, scientific developments, technological changes, and new industry needs.

## 1.3. Next Steps

### 1.3.1. Transition Period

The Steering Committee has set a transition period of at least two years before requiring reports from financial institutions and other entities on their inclusive and/or green financial flows based on the taxonomy. During these two years (or longer if needed), the Steering Committee will consider various matters concerning the taxonomy's application such as its (i) scope (i.e., entities that will be subject to reporting requirements), (ii) modality (e.g., the reporting format and frequency), and (iii) type of support needed to build capacity and facilitate the transition process.

### 1.3.2. Green Finance Centre and Technical Screening Criteria

The taxonomy is intended to be a living document to be updated and expanded over time. Support for the Steering Committee and the Technical Working Group in undertaking this task, including the coordination of the revision process and preparation of knowledge products (e.g., case studies, training sessions), will be offered by a Green Finance Centre to be established in the second half of 2022.

One of the Green Finance Centre's most important roles during the transition period is to support the development of technical screening criteria and thresholds that will help determine whether an activity meets the taxonomy's objectives. For each of the activities identified in the taxonomy, technical screening criteria that include metrics, thresholds, or specific requirements will be developed in the next major update.

The technical screening criteria will be based on local policies, benchmarks, and international standards such as the following:

- International Platform on Sustainable Finance's (IPSF) Common Ground Taxonomy – Climate Change Mitigation (2021)
- Climate Bonds Initiative – Climate Bonds Taxonomy Screening Indicators (2021)
- European Bank for Reconstruction and Development's (EBRD) Green Technology Selector
- PNG's updated NDCs (2021)
- EU Taxonomy – Climate Delegated Act (2021)
- Malaysia's Climate Change and Principle-based Taxonomy (2021)
- Mongolian Green Taxonomy (2019)
- PNG's National Adaptation Plan (NAP) (2022)
- International Finance Corporation's (IFC) Climate Smart Agriculture Financing Opportunities (2021)
- South African Green Finance Taxonomy (March 2022)
- Green Bond Endorsed Project Catalogue (2021)
- Colombia Green Taxonomy (draft 2021)
- IFC Guidelines for Blue Finance (2022)

With the support of the Green Finance Centre, BPNG will provide overall direction and oversight to other inclusive/green finance initiatives and also inform the development of future regulatory instruments and the updating of the taxonomy. BPNG's regulatory guidance will consider emerging international best practices and approaches, including work led by the International Sustainability Standards Board, to deliver a comprehensive global baseline for sustainability-related disclosure standards. The disclosure standards will provide investors and other financial market participants with information about companies' sustainability-related risks and help them make informed decisions.



## 1.4. Inclusive and Green Taxonomy

1. Agriculture, Sustainable Land Use & Marine Resources (PNG Priority Sector)			
Macro Sector	Sub-Sector	Activity/Technologies Description & Examples	Metric / Threshold / Technical Screening Criteria PNG Agency Domain
Agriculture, Forestry, Land-use & Marine Resources	1.1 Agriculture	<p>1.1.1 Regenerative Agriculture and Improvement of soil health</p> <p>Transition from temporary crops or pastures to agroforestry systems (e.g., cocoa, fruit trees or forestry) and agro silvo pastoral system.</p> <ul style="list-style-type: none"> <li>Example: Permaculture, agroecology, agroforestry, restoration ecology, keyline design, and holistic management</li> </ul> <p>Replace synthetic fertilizers with fertilizers prepared from organic material, such as harvest waste, pruning, manure, grass, etc.</p> <p>Introduce green manures, such as beans, crotalaria, canavalia, among others.</p> <p>See MEBA Activities for Micro Clients</p> <p><a href="https://unepmeba.org/wp-content/uploads/2020/01/Microfinance_for-Ecosystem_based_Adaptation_EN.pdf">https://unepmeba.org/wp-content/uploads/2020/01/Microfinance_for-Ecosystem_based_Adaptation_EN.pdf</a></p>	<p><i>Detailed technical screening criteria TBD.</i></p> <ul style="list-style-type: none"> <li>Project length of at least five years</li> <li>Reduced tillage</li> <li>Avoided erosion</li> <li>No open burning</li> </ul> <p>PNGDAL/ NARI</p>
		<p>1.1.2 Reduction in energy use in traction</p> <ul style="list-style-type: none"> <li>Example: efficient tillage, irrigation, and other agricultural processes</li> </ul>	<p><i>Detailed technical screening criteria TBD.</i></p> <p>20% reduction in Energy use from Baselines.</p> <p>(Need to set baselines for PNG by technical experts)</p> <p>Catalog of green equipment and standardized products, technologies, material, equipment.</p> <p>PNGDAL/ NARI</p>



		<p>1.1.3 Agricultural projects that improve existing carbon pools</p> <p>Change land use towards systems with greater carbon sequestration (such as agroforestry systems), which have better soil protection and are consistent with their vocation. Conserve water resources.</p> <ul style="list-style-type: none"> <li>Example: Rangeland management, collection and use of bagasse, rice husks, or other agricultural waste, reduced tillage techniques that increase carbon contents of soil, rehabilitation of degraded lands, peatland restoration, etc.</li> </ul>	<p><i>Detailed technical screening criteria TBD</i></p> <ul style="list-style-type: none"> <li>Project length of at least five years</li> <li>Reduced tillage</li> <li>Avoided erosion</li> <li>No open burning</li> </ul> <p><i>Evidence that soil carbon sequestration is likely to be maintained for 20 years or more (secure land rights, low threat of conversion, contractual commitments) or demonstrate 50% higher level of sequestration</i></p> <p>PNGDAL/ NARI</p>
		<p>1.1.4 Reduction of non-CO2 GHG emissions from agricultural practices, technologies, and fertilizer types</p> <ul style="list-style-type: none"> <li>Example: Paddy rice production, reduction in fertilizer use, etc.</li> </ul>	<p><i>Detailed technical screening criteria TBD</i></p> <p>PNGDAL/ NARI</p>

		<p>1.1.5 Organic Farming and Certified Agriculture Projects</p> <p>Agriculture projects utilizing international certification schemes which have climate change mitigation components.</p> <p>This activity includes:</p> <ul style="list-style-type: none"> <li>• Manufacture of fresh liquid milk, pasteurized, sterilized, homogenized and/or ultra-heat treated</li> <li>• Manufacture of milk-based drinks</li> <li>• Manufacture of cream from fresh liquid milk, pasteurized, sterilized, homogenized</li> <li>• Manufacture of dried or concentrated milk whether or not sweetened</li> <li>• Manufacture of milk or cream in solid form</li> <li>• Manufacture of butter</li> <li>• Manufacture of yoghurt</li> <li>• Manufacture of cheese and curd</li> <li>• Manufacture of whey</li> <li>• Manufacture of casein or lactose</li> <li>• Manufacture of ice cream and other edible ice such as sorbet</li> </ul>	<p><i>Detailed technical screening criteria TBD.</i></p> <p><i>Organic Certification.</i></p> <p><i>Eligible certifications schemes include:</i></p> <ul style="list-style-type: none"> <li>• <i>Climate Bonds certification (bond certification)</i></li> <li>• <i>Crop certification</i></li> <li>• <i>Global GAP</i></li> <li>• <i>Roundtable on Sustainable Biomaterials Certificate</i></li> </ul> <p><i>PNGDAL/ NARI</i></p>
		<p>1.1.6 Projects enhancing food security</p> <ul style="list-style-type: none"> <li>• Example: Pest management</li> </ul> <p>Conversion of grassland to cropland (Oil Palm Standards used by NBPOL)</p>	<p><i>Eligibility or detailed technical screening criteria TBD.</i></p>
	1.2 Afforestation and reforestation, biosphere conservation	<p>1.2.1 Afforestation (plantations) and agroforestry on non-forested land</p> <p>Establishment of forest through planting, deliberate seeding or natural regeneration on land that, until then, was under a different land use or not used. Afforestation implies a transformation of land use from non-</p>	<p><i>Detailed technical screening criteria TBD</i></p> <p><i>Apply Climate Bonds Criteria:</i>  <a href="https://www.climatebonds.net/standard/forestry">https://www.climatebonds.net/standard/forestry</a>  <i>or the local criteria can be applied for:</i></p> <ul style="list-style-type: none"> <li>• <i>Afforestation plan and subsequent forest</i></li> </ul>



		forest to forest, in accordance with the Food and Agriculture Organization of the United Nations (FAO) definition of afforestation, where forest means a land matching the forest definition as set out in national law, or where not available, is in accordance with the FAO definition of forest. Afforestation may cover past afforestation as long as it takes place during the period between the planting of the trees and the time when the land use is recognized as a forest	<p><i>management plan or equivalent instrument</i></p> <ul style="list-style-type: none"> <li>• <i>Climate benefit analysis</i></li> <li>• <i>Guarantee of permanence</i></li> <li>• <i>Audit</i></li> <li>• <i>Group assessment</i></li> </ul> <p><i>Certificate of Approval by PNGDAL</i></p> <p><i>REDD+ PNGDAL/ NARI</i></p>
	1.2.2 Reforestation on previously forested land	<p>Rehabilitation and restoration of forests as defined by PNG law. Where PNG law does not contain such a definition, rehabilitation and restoration corresponds to a definition with broad agreement in the peer-reviewed scientific literature for specific countries or a definition in line with the FAO concept of forest restoration or a definition in line with one of the definitions of ecological restoration applied to forest, or forest rehabilitation under the Convention on Biological Diversity. The economic activities in this category also include forest activities in line with the FAO definition of “reforestation” and “naturally regenerating forest” after an extreme event, where extreme event is defined by national law, and where national law does not contain such a definition, is in line with the IPCC definition of extreme weather event; or after a wildfire, where wildfire is defined by national law, and where national law does not contain such a definition, as defined in the European Glossary for wildfires and forest fires. The economic activities in this category imply no change of land use and occurs on degraded land matching the forest definition as set out in national law, or where not available, in accordance with the FAO definition of forest.</p>	<p><i>Detailed technical screening criteria TBD</i></p> <p><i>Apply Climate Bonds Criteria: <a href="https://www.climatebonds.net/standard/forestry">https://www.climatebonds.net/standard/forestry</a> or the local criteria can be applied for:</i></p> <ul style="list-style-type: none"> <li>• <i>Afforestation plan and subsequent forest management plan or equivalent instrument</i></li> <li>• <i>Climate benefit analysis</i></li> <li>• <i>Guarantee of permanence</i></li> <li>• <i>Audit</i></li> <li>• <i>Group assessment</i></li> </ul> <p><i>PNGDAL/ NARI</i></p>

		1.2.3 Biosphere conservation and restoration projects (including payments for ecosystem services) seeking to reduce emissions from the deforestation or degradation of ecosystems	<i>PNGDAL/ NARI</i>
		1.2.4 Support or services to communities to enter carbon markets • Example: via REDD+ program	<i>Eligibility or detailed technical screening criteria TBD</i>
	1.3 Forest and Logging	1.3.1 Sustainable forest management activities that increase carbon stocks or reduce the impact of forestry activities  Forest management as defined by national law. Where national law does not contain such a definition, forest management corresponds to any economic activity resulting from a system applicable to a forest that influences the ecological, economic or social functions of the forest. Forest management assumes no change in land use and occurs on land matching the definition of forest as set out in national law, or (when such a definition is not available) the FAO definition of forest.	<i>Detailed technical screening criteria TBD</i>  <i>Apply Climate Bonds Criteria: <a href="https://www.climatebonds.net/standard/forestry">https://www.climatebonds.net/standard/forestry</a> or the local criteria can be applied for:</i> <ul style="list-style-type: none"> <li>• <i>Afforestation plan and subsequent forest management plan or equivalent instrument</i></li> <li>• <i>Climate benefit analysis</i></li> <li>• <i>Guarantee of permanence</i></li> <li>• <i>Audit</i></li> <li>• <i>Group assessment</i></li> </ul> <i>PNGDAL/ NARI</i>
		1.3.2 Conservation forestry  Forest management activities with the objective of preserving one or more habitats or species.	<i>Detailed technical screening criteria TBD</i>  <i>No change in land category and occurs on land matching the forest definition as set out in national law, or (when such a definition is not available) in accordance with the FAO definition of forest.</i>  <i>PNGDAL/ NARI</i>





		1.3.3 Plantations and natural forests	<p><i>Detailed technical screening criteria TBD.</i></p> <p><i>Certificate of Approval.</i></p> <p><i>No conversion from natural landscape and the health of the forest is well managed (Sustainable Forestry Certificate) – align to ADB/ IFC safeguards</i></p> <p><i>PNGFA</i></p>
		1.3.4 Machinery and equipment to manage and cultivate eligible forested land	<p><i>Detailed technical screening criteria TBD.</i></p> <p><i>PNGFA</i></p> <p><i>Eligible if the forest and timber production adheres with the above.</i></p>
		1.3.5 Management, information systems, and other technologies associated with above	<p><i>Detailed technical screening criteria TBD.</i></p>
	1.4 Pulp & paper	1.4.1 Production facilities incorporating efficient pulping process, bio-refineries, use of recyclates	<p><i>Detailed technical screening criteria TBD.</i></p>
	1.5 Livestock	<p>1.5.1 Livestock projects that reduce methane or other GHG emissions</p> <ul style="list-style-type: none"> <li>• Example: Manure management with biodigesters and improved feeding practices to reduce methane emissions, Rearing livestock and interventions to enhance adaptation and resilience</li> </ul>	<p><i>Detailed technical screening criteria TBD</i></p> <p><i>Demonstration of significant carbon sequestration, reduction in emissions, or compatibility with ‘low carbon agriculture’ targets and/or adaptation and resilience activities</i></p> <p><i>PNGDAL</i></p>

		<p>1.5.2 Green animal husbandry</p> <p>Green animal husbandry projects carried out to promote the efficiency of animal husbandry resources and environmental protection. For example:</p> <ul style="list-style-type: none"> <li>• Harmless treatment systems for sick and dead livestock and poultry</li> <li>• Facility construction for storage, treatment, and utilization of waste from livestock and poultry breeding</li> <li>• Construction of environment-friendly breeding facilities, such as elevated beds</li> <li>• Construction of agricultural industrial parks with a circular system between breeding, biogas, planting, and processing</li> </ul>	<p><i>Detailed technical screening criteria TBD</i></p> <p><i>Meet local certification scheme that has ecological conservation and/or resource efficiency components</i></p> <p><i>PNGDAL/ NARI</i></p>
		<p>1.5.3 Construct physical structures and install equipment to protect livestock against heat stress</p> <p>Construct physical structures and install equipment to protect livestock against heat stress (e.g., adequate cooling, air flow, evaporative systems, water misting and ventilation); elevated livestock shelters (e.g. raised foundations); protection of livestock against heat stress (e.g. shade screens or shade cloth structures).</p>	<p><i>Direct eligibility</i></p>
	1.6 Crops	<p>1.6.1 Resilient Crops</p> <p>Agricultural land used for the production of crops, agroforestry and silvopastoral systems</p>	<p><i>Eligible crops determined by Agency</i></p> <p><i>PNGDAL/ NARI</i></p>
		<p>1.6.2 Other agricultural practices: Introduction of polycultures or associated crops in permanent crops Introducing polycultures or crops associated with compatible species (preferably native timber or fruit trees) protects the soil, increases carbon and nitrogen fixation, diversifies production and increases resilience to climate variability.</p>	<p><i>Direct eligibility</i></p>



	1.7 Infrastructure	1.7.1 Machinery and equipment to manage and cultivate eligible land or livestock	<p><i>Eligible land determined by Agency.</i></p> <p><i>Eligible if the agricultural production adheres with the above.</i></p> <p><i>PNGDAL/ NARI</i></p>
		1.7.2 Other agricultural practices: Implementation of clean energy and energy efficiency measure (May be listed under RE or EE)	<p><i>Direct eligibility for renewable energy and methane gas. Fuel saving subject to % criteria.</i></p> <p><i>PNGDAL/ NARI</i></p>
		1.7.3 Management, information systems and other technologies associated to above	
		1.7.4 Drip, flood, and pivot irrigation systems	<i>Direct eligibility</i>
		1.7.5 Biodigesters	<i>Direct eligibility</i>
	1.8 Natural Ecosystem Protection and Restoration	1.8.1 Land remediation and clean up	<p><i>Detailed technical screening criteria TBD</i></p> <p><i>Habitat is appropriate for the location and is maintained in good health</i></p> <p><i>CEPA/CCDA</i></p>
		1.8.2 Natural ecosystem land as designated by AGENCY (managed and unmanaged)	<p><i>Detailed technical screening criteria TBD</i></p> <p><i>Determined by Agency</i></p>
		1.8.3 Machinery and equipment to manage eligible ecosystems	<p><i>Detailed technical screening criteria TBD.</i></p> <p><i>Eligible if the related land follows the above.</i></p>
		1.8.4 Management and information systems and other technologies to manage eligible ecosystems	<i>Detailed technical screening criteria TBD.</i>

	1.9 Eco-Tourism	1.9.1 Products and services promoting eco-tourism development	<p><i>Detailed technical screening criteria TBD.</i></p> <p><i>Demonstration that project is targeted at ecological restoration and protection, community-based tourism, protection and development of national parks and geological parks, protection of natural heritage and/or specially protected areas.</i></p> <p><i>PNGTPA</i></p>
		1.9.2 Sustainable hotel & camp management	<p><i>Detailed technical screening criteria TBD.</i></p> <p><i>In compliance with local or nationally recognized sustainable hospitality industry standards.</i></p>
	2.0 Fisheries	2.0.1 Sustainable wild fisheries and farmed fish	<p><i>Detailed technical screening criteria TBD.</i></p> <p><i>Must hold certification for sustainable management MSC Fisheries Standard Certification - RINA.org.</i></p> <p><i>PNG NFA</i></p>
	2.1 Fisheries Infrastructure	2.1.1 Machinery and equipment to manage and harvest in fisheries and fish farms	<p><i>Detailed technical screening criteria TBD.</i></p> <p><i>PNG NFA</i></p> <p><i>Eligible if the fishery or aquaculture operation adheres with the above. [Types of fish and risk profile of what is overfished]</i></p>
		2.1.2 On-shore and off-shore fish processing and storage facilities connected to eligible fisheries and fish farms	<p><i>Detailed technical screening criteria TBD</i></p>
		2.1.3 Management, information systems and other technologies associated with above	<p><i>Direct eligibility</i></p>



	2.2 Supply chain	2.2.1 Input supply systems for seed production, distribution, and access for eligible crops	<i>Detailed technical screening criteria TBD</i>  <i>Facility is sustainable managed and certified as such</i>  <i>PNG NFA</i>
		2.2.2 Primary processing and storage facilities for eligible agricultural produce	<i>Detailed technical screening criteria TBD</i>  <i>Eligible if agricultural produce complies with relevant criteria</i>
		2.2.3 Primary processing and storage facilities for eligible forestry produce	<i>Detailed technical screening criteria TBD</i>  <i>Eligible if forest produce complies with relevant criteria</i>
		2.2.4 Primary processing facilities and storage for eligible fisheries and aquaculture activities	<i>Detailed technical screening criteria TBD</i>  <i>Eligible if fish produce complies with relevant criteria</i>
	2.3 Conservation	2.3.1 Terrestrial and aquatic biodiversity conservation	
	2.4 Research and Development	2.4.1 Research and development and application of green prevention/ control products  Research, development, promotion, and commercial application of green prevention/ control products including but not limited to:  <ul style="list-style-type: none"> <li>• Research, development, promotion, and commercial application of green prevention/control products such as green efficient functional fertilizers, biological fertilizers, new soil conditioners, low-risk pesticides, pesticide application agents, and physical and chemical inducements</li> <li>• Research, development, promotion, and commercial application of emerging products (such as green efficient feed additives, low-toxicity and low drug-resistance veterinary drugs, and efficient and safe vaccines, etc.)</li> </ul>	<i>Detailed technical screening criteria TBD</i>



## 2. Renewable Energy (PNG Priority Sector)

Macro Sector	Sub-Sector	Activity/Technologies Description & Examples	Metric / Threshold / Technical Screening Criteria PNG Agency Domain
Renewable Energy	2.1 Electricity Generation	2.1.1 On-Shore Wind power	<i>Meeting licensing requirements for grid connection and Do No Significant Harm to Environment – More detailed eligibility criteria TBD</i>
		2.1.2 Solar power (concentrated solar power, photovoltaic power)	<i>Meeting licensing requirements for grid connection and Do No Significant Harm to Environment – More detailed eligibility criteria TBD</i>  <i>Facilities shall have no more than 15% of electricity generated from non-renewable sources except in situations where existing thermal generation is being replaced by renewable energy generation</i>  <i>PNG NEA/ PNG Power Ltd</i>
		2.1.3 Pico Solar and attached devices	<i>Direct eligibility</i>
		2.1.4 Geothermal power  • Example: Facilities for electricity generation and thermal applications of geothermal power in all sectors, geothermal heat pumps for space and district heating	<i>Meeting licensing requirements for grid connection and Do No Significant Harm to Environment – More detailed eligibility criteria TBD</i>  <i>Direct emissions less than 100gCO<sub>2</sub>/kWh only if net emission reductions can be demonstrated</i>
		2.1.5 Biomass or biogas power station	<i>Meeting licensing requirements for grid connection and Do No Significant Harm to Environment – More detailed eligibility criteria TBD</i>  <i>Emissions of electricity generated must be lower than 100gCO<sub>2</sub>/kWh</i>  <i>and</i>  <i>Biofuel must be sourced from a sustainable feedstock (the only timber feedstock allowed is waste wood) only if it results in net emission reductions, taking into account production, processing and transportation.</i>



	2.1.6 Hydropower Plants	<p>Meeting licensing requirements for grid connection and Do No Significant Harm to Environment – More detailed eligibility criteria TBD</p> <p>Only if net emission reductions can be demonstrated</p> <p>In operation before 2020 power density &gt; 5W/m<sup>2</sup>; or GHG emissions intensity of electricity generated &lt; 100gCO<sub>2</sub>e/kWh. Commencing operation in 2020 or after: power density &gt; 10W/m<sup>2</sup>; or GHG emissions intensity &lt; 50g CO<sub>2</sub>e/kWh AND</p> <p>Must perform an assessment, based on recognized best practice guidelines for environmental and social risks and incorporate measures to address risks</p> <p>Only for pumped storage: facility will not be charged with carbon intensive energy OR facility is contributing to a grid which has at least 20% share of intermittent renewables</p> <p>PNG NEA/ PNG Power Ltd</p>
	2.1.7 Micro-Hydro installations	<p>Direct Eligibility for Off-Grid project and</p> <p>Do No Significant Harm to Environment Assessment</p>
	2.1.8 Offshore wind farms	<p>Meeting licensing requirements for grid connection and Do No Significant Harm to Environment – More detailed eligibility criteria TBD</p>
	2.1.9 Offshore solar farms	
	2.2.0 Tidal and wave energy generation facilities	
	2.2.1 Other marine electricity generation and ocean power facilities using ocean thermals, salinity, gradients, wave, tidal, ocean currents, salt gradient, etc.	<p>Fossil fuel back up can only be used for restart capability and monitoring, operating or resilience measures in the event of no power in the system</p>
	2.2.2 Heating or cooling facilities using ocean thermals	<p>Must achieve an 80% reduction in gCO<sub>2</sub>e/kWh compared to fossil fuel alternative</p>

	2.3 Heat production or other renewable energy application	2.3.1 Solar water heating and other thermal applications of solar power in all sectors	<i>Do No Significant Harm to Environment – More detailed eligibility criteria TBD</i>  <i>PNG NEA/ PNG Power Ltd</i>
		2.3.2 Thermal applications of geothermal power in all sectors	
		2.3.3 Wind-driven pumping systems or similar applications	
		2.3.4 Thermal applications of sustainably produced bioenergy in all sectors	
	2.4 Measures to facilitate integration of renewable energy into grids	2.4.1 New, expanded, and improved transmission systems  Examples: <ul style="list-style-type: none"> <li>• Overhead lines (conductors and insulators) and pylons</li> <li>• Transformers, reactors, and substations</li> <li>• Underground cables</li> <li>• Circuit breakers and switchgear</li> <li>• Sub-stations, buildings, fences and busbars</li> <li>• Fuses, circuit breakers, disconnectors, reactors, capacitors, transformers, voltage regulators and switchgear</li> </ul>	<i>Detailed technical screening criteria TBD</i>  <i>Is a dedicated connection to a power production plant eligible under one of the climate bonds sector criteria (e.g. Solar)</i>  <i>Is a dedicated connection to a power production plant operating under the low carbon power threshold (100g CO2/kWh)</i>  <i>The infrastructure is located on a system with a grid factor at or below 100 g CO2/kWh</i>  <i>The infrastructure is located on a system for which at least 67% of its added generation capacity in the last 5 years falls below the low carbon power threshold</i>  <i>PNG NEA/ PNG Power Ltd</i>
		2.4.2 Storage systems (battery, mechanical, pumped storage) that facilitate the integration of renewables, or increase renewable energy	<i>Detailed technical screening criteria TBD</i>
		2.4.3 New information and communication technology, smart-grid and mini-grid	<i>Detailed technical screening criteria TBD</i>



Lower Carbon and Efficient Energy Generation	2.5 Retrofits	2.5.1 Retrofit of transmission lines or substations and/or distribution systems to reduce energy use and/or technical losses including improving grid stability/reliability	<p><i>Detailed technical screening criteria TBD</i></p> <p><i>Minimum 80% pollution reduction compared to fossil fuel baseline.</i></p> <p><i>In case of capacity expansion, only the portion of the investment that is reducing existing losses is included</i></p> <p><i>PNG NEA/ PNG Power Ltd</i></p>
	2.6 Power plant Improvements	2.6.1 Thermal power plant retrofit to fuel switch from a more GHG-intensive fuel to a different and less GHG-intensive fuel type	<p><i>Detailed technical screening criteria TBD</i></p> <p><i>Does not qualify for New Zealand Funding, which prohibits any investment in fossil fuels</i></p> <p><i>PNG NEA/ PNG Power Ltd</i></p>
		2.6.2 Conversion of existing fossil-fuel-based power plants to co-generation technologies that generate electricity in addition to providing heating/cooling	
		2.6.3 Energy efficiency improvement in existing thermal power plant	<i>Direct eligibility</i>
		2.6.4 Renewable energy power plant retrofits	<i>Direct eligibility</i>
	2.7 Bio-Fuel - Production of biofuels, including biodiesel and bioethanol	2.7.1 Facilities producing liquid biofuel, solid and gaseous biomass for heating and cogeneration	<p><i>Detailed technical screening criteria TBD.</i></p> <p><i>80% GHG emission reduction compared to fossil fuel baseline and</i></p> <p><i>Biofuel must be sourced from a sustainable feedstock (the only timber feedstock allowed is waste wood).</i></p> <p><i>≥50% Biomass based products produced for energy use.</i></p> <p><i>Department of Petroleum</i></p>
		2.7.2 Facilities producing liquid biofuel, solid and gaseous biomass for electricity production	
		2.7.3 Facilities producing biofuel for transport	
		<ul style="list-style-type: none"> <li>Example: Aviation Fuel delivering substantial reduction in gCO<sub>2</sub>e/ passenger or ton/km</li> </ul>	
		2.7.4 Biofuel preparation process facilities, pretreatment facilities, and biorefinery facilities	<p><i>Detailed technical screening criteria TBD.</i></p> <p><i>In the transport sector, fuel delivering substantial reduction in gCO<sub>2</sub>e/passenger or ton/km.</i></p>

### 3. Energy Efficiency (Australian or New Zealand Standards EE Standards may be used)

Macro Sector	Sub-Sector	Activity/Technologies Description & Examples	Metric / Threshold / Technical Screening Criteria PNG Agency Domain
Energy Efficiency	3.1 Energy efficiency in industry in existing facilities	3.1.1 Energy efficiency improvements through the installation of more efficient equipment, changes in processes, reduction of heat losses and/or increased waste heat recovery and/or resource efficiency	<i>Baselines and detailed technical screening criteria TBD.</i>  <i>Minimum 20% GHG emission reduction or Energy consumption reduction from baseline.</i>  <i>Upgrades to coal, oil, diesel, and gas facilities/technologies is excluded.</i>  <i>PNG NEA/ PNG Power Ltd</i>
		3.1.2 Installation of co-generation plants that generate electricity in addition to providing heating/cooling	
		3.1.3 More efficient facility replacement of an older (retired) facility with a more efficient one	
	3.2 Energy efficiency improvements in existing commercial, public and residential buildings	3.2.1 Energy efficiency improvement in temperature control, lighting, appliances, and equipment	<i>Baselines and detailed technical screening criteria TBD.</i>  <i>Minimum 20% GHG emission reduction or energy consumption reduction from baseline.</i>  <i>Green product, equipment, and material catalog to be developed.</i>  <i>PNG NEA/ PNG Power Ltd</i>
		3.2.2 Substitution of existing heating/cooling systems for buildings by cogeneration plants that generate electricity in addition to providing heating/cooling	
		3.2.3 Retrofit of existing buildings: architectural or building changes that enable reduction of energy consumption	
	3.3 Energy efficiency improvements in the utility sector and public services	3.3.1 Energy efficiency improvements in utilities and public services through the installation of more efficient lighting or equipment	
		3.3.2 Rehabilitation of district heating systems	
		3.3.3 Utility heat loss reduction and/or increased waste heat recovery	
		3.3.4 Improvement in utility-scale energy efficiency through efficient energy use, and loss reduction, or resource efficiency improvements	



	3.4 Energy efficiency in a new commercial, public, and residential buildings	3.4.1 Use of highly efficient architectural designs, energy-efficient appliances and equipment, and building techniques that reduce building energy consumption, exceed available standards, and comply with high energy efficiency certification or rating schemes	<i>Baselines and detailed technical screening criteria TBD.</i>  <i>Green product catalog to be developed.</i>  <i>PNG NEA/ PNG Power Ltd/ National Housing Commission/ Department of Transport</i>
	3.5 Energy audits	3.5.1 Energy audits to energy end-users, including industries, buildings, and transport systems	<i>Direct eligibility</i>
	3.6 Supply Chain	3.6.1 Support to importers of energy efficient products, equipment, and materials	<i>TBD and based on EE approved product catalog or energy labels.</i>

4. Clean Transport			
Macro Sector	Sub-Sector	Activity/Technologies Description & Examples	Metric / Threshold / Technical Screening Criteria PNG Agency Domain
Private Passenger Transport	4.1 Passenger Vehicles	4.1.1 Electric passenger vehicle	Zero Tailpipe Emissions.
		4.1.2 Hydrogen passenger vehicle	Department of Transport/ Local Car Sale Dealers (Boroko/Ela Motors)
		4.1.3 Non-motorized transport (bicycles and pedestrian mobility)	
		4.1.4 Other passenger vehicles, e.g., hybrid vehicles	Vehicle meets universal gCO <sub>2</sub> /p-km (passenger per kilometer) threshold.
Public Passenger Transport	4.2 Busses	4.2.1 Buses with no direct emissions (electric or hydrogen)	Zero Tailpipe Emissions. Department of Transport/ Local Car Sale Dealers
	4.3 Trains	4.3.1 Rolling stock and vehicles for electrified public transport, such as electrified rail, trams, trolleybuses, and cable cars	Passenger transport system meets universal gCO <sub>2</sub> /p-km (passenger-kilometer) threshold.
		4.3.2 Fossil fuel or hybrid vehicles for public transport	Vehicle meets universal gCO <sub>2</sub> /p-km (passenger-kilometer) threshold
Rail Freight	4.4 Trains	4.4.1 Rolling stock for electrified freight rail	Fossil fuel freight must not be more than 25% of the freight transported (in tonne/km)
		4.4.2 Rolling stock for non-electrified freight rail	Fossil fuel freight must not be more than 25% of the freight transported (in tonne/ km) Transport meets universal gCO <sub>2</sub> /t-km (tonne-kilometre) threshold
		4.4.3 All infrastructure for electrified freight rail	Eligible if the associated rail is eligible
Road Freight	4.5 Lorries and Trucks	4.5.1 Vehicles with no direct emissions (electric or hydrogen)	Zero Tailpipe Emissions Department of Transport/ Local Car Sale Dealers
Shipping	4.6 Shipping Vessels	4.6.1 Cargo ships	Detailed technical screening criteria TBD.
		4.6.2 Zero-Emissions vessels	Use of low GHG fuel (e.g., hydrogen, ammonia, electric, high % of biofuel), delivering required emissions intensity thresholds gCO <sub>2</sub> e/ton/km.
		4.6.3 Passenger ships • Example: Cruise ships or ferries	Department of Transport/ National Maritime Safety Authority





MISCELLANEOUS VEHICLES	4.7 Vehicles	4.7.1 Zero direct emissions miscellaneous vehicles such as waste collection vehicles or construction vehicles	<p><i>Detailed technical screening criteria TBD.</i></p> <p><i>Must deliver substantial GHG emissions savings on either a passenger/km or a ton/km basis.</i></p> <p><i>Eligible if the transport mode supported is eligible according to one of the criteria above.</i></p> <p><i>Department of Transport</i></p>
	4.8 Urban transport modal change	4.8.1 Urban mass transit	<p><i>Detailed technical screening criteria TBD</i></p>
Cross Cutting Transport	4.9 Infrastructure for low carbon transport	4.9.1 Charging stations and other infrastructure for electric vehicles or hydrogen or alternative fuel infrastructure (when separate from fossil fuel filling stations and garages) including dedicated infrastructure for electrified public transport	<p><i>Detailed technical screening criteria TBD.</i></p> <p><i>Must deliver substantial GHG emissions savings on either a passenger/km or a ton/ km basis.</i></p> <p><i>Eligible if the transport mode supported is eligible according to one of the criteria above.</i></p> <p><i>Department of Transport/ DPLGA/ NCD Commission</i></p>
	5.0 ICT	5.0.1 ICT that improves asset utilization, flow, and modal shift, regardless of transport mode (public transport information, car-sharing schemes, smart cards, road charging systems, etc.)	<p><i>Detailed technical screening criteria TBD</i></p>
	5.1 Transport-oriented urban development	5.1.1 Integration of transport and urban development planning (dense development, multiple land-use, walking communities, transit connectivity, etc.), leading to a reduction in the use of passenger cars <ul style="list-style-type: none"> <li>• Example: Public walking and cycling infrastructure and cycling schemes, bus rapid transit systems</li> </ul>	<p><i>Detailed technical screening criteria TBD</i></p>
		5.1.2 Transport and travel demand management measures dedicated to reducing pollutant emissions, including GHG emissions (e.g., high-occupancy vehicle lanes, congestion charging/road pricing, parking management, restriction or auctioning of license plates, car-free city areas, low-emission zones)	<p><i>Detailed technical screening criteria TBD</i></p>

	5.2 Inter-urban transport	5.2.1 Railway transport ensuring a modal shift of freight and/or passenger transport from road to rail (improvement of existing lines or construction of new lines)	<i>Detailed technical screening criteria TBD.</i>  <i>Department of Transport/ DPLGA/ NCD Commission</i>
		5.2.2 Waterways transport ensuring a modal shift of freight and/or passenger transport from road or air to waterways (improvement of existing infrastructure or construction of new infrastructure)	<i>Detailed technical screening criteria TBD</i>
	5.3 Intermodal Facilities and Systems	5.3.1 Intermodal freight facilities	<i>Detailed technical screening criteria TBD</i>
		5.3.2 Terminals to improve journey times	
		5.3.3 Smart freight logistics	
		5.3.4 Multi-modal logistics hubs	



5. Green Buildings & Urban Development			
Macro Sector	Sub-Sector	Activity/Technologies Description & Examples	Metric / Threshold / Technical Screening Criteria PNG Agency Domain
Buildings	5.1 New Commercial buildings	5.1.1 New commercial buildings, including offices, hotels, retail buildings, public buildings, educational buildings, healthcare buildings etc.	<i>Detailed technical screening criteria TBD</i>  <i>An emissions footprint in the top 15% of emissions performance in the local market</i>  <b>OR</b>  <i>A substantial reduction in Gco2/m2 because of upgrade or retrofit meets regional, national, or internationally recognized standards, codes, or certifications. – BREEAM, LEED, World Green Building Council or the New Zealand Green Building Council or Green Building Index of Malaysia Green Building Index</i>  <i>Department of Lands &amp; Physical Planning/ NCDC/ DPLGA/ National Housing Commission</i>
	5.2 New Residential Buildings	5.2.1 New private dwellings	
		5.2.2 Multifamily residential buildings	
		5.2.3 Implementation of climate-friendly refrigerants	<i>Direct eligibility</i>
	5.3 Other building types	5.3.1 Data centers	<i>Detailed technical screening criteria TBD</i>
		5.3.2 Stations and related building for eligible transport	
Urban Development	5.4 Urban Infrastructure	5.4.1 Building, maintaining, or upgrading utility tunnels for cables or pipelines	<i>Detailed technical screening criteria TBD.</i>  <i>Significant resource and energy efficiency improvements.</i>  <i>Department of Lands &amp; Physical Planning/ NCDC/ DPLGA/ National Housing Commission</i>
Adaptation Related Improvements		5.4.2 Resilient housing improvements <ul style="list-style-type: none"> <li>• Example: Adaptation improvements in at risk areas prone to flooding.</li> </ul>	<i>Detailed technical screening criteria TBD</i>  <i>Department of Lands &amp; Physical Planning/ NCDC/ DPLGA/ National Housing Commission</i>

		5.4.3 Urban and rural infrastructure improvements related to climate change risks	<i>Detailed technical screening criteria TBD</i>
		5.4.4 Construction and operation of certified sustainable tourism destinations <ul style="list-style-type: none"> <li>• Example: Construction and operation of tourism destinations certified under the National Sustainable Tourism Certification Scheme in collaboration with Global Sustainable Tourism Council (GSTC).</li> </ul>	
		5.4.5 Retrofit the coastal tourism properties to improve climate resilience  Retrofit the coastal tourism properties in identified vulnerable areas (e.g., low-lying beaches, other disaster prone areas) to improve its climate resilience.	<i>Direct eligibility</i>



6. Industry (Small industry improvements in Energy Efficiency)			
Macro Sector	Sub-Sector	Activity/Technologies Description & Examples	Metric / Threshold / Technical Screening Criteria PNG Agency Domain
General Industry	6.1 Circular Economy	6.1.1 Eco-efficient and/or circular economy adapted products, production technologies and processes	<p><i>Detailed technical screening criteria TBD.</i></p> <p><i>Significant CO2 emission, resource, productivity, waste reduction and energy efficiency improvements.</i></p> <p><i>Department of Commerce, Trade &amp; Industry</i></p>
	6.2 Industrial processes	6.2.1 Reduction in GHG emissions resulting from industrial process improvements, process/product substitutions, and cleaner production (e.g., cement, chemical), excluding carbon capture and storage	
Cement	6.3 Cement production facilities	6.3.1 Production facilities, incorporating dry processes, reduced clinker content	
Steel	6.4 Steel and iron production facilities	6.4.1 Production facilities and equipment, incorporating electric arc furnace, smelting reduction, efficient casting processes	
Basic Chemicals	6.5 Basic Chemical Production	6.5.1 Production facilities incorporating lower carbon feedstocks and more efficient processes	
Supply Chain Facilities			
Energy Efficiency equipment	6.6 Manufacturing Facilities and Other supply Chain Projects	<p>6.6.1 Facilities dedicated to manufacturing key components for eligible facilities, equipment, material, and sectors including facilities dedicated to the storage, distribution, or retail of eligible industrial or manufactured products</p> <p>Manufacture of energy efficiency equipment for buildings</p> <ul style="list-style-type: none"> <li>Example: Low carbon and alternative building materials such as alternatives to cement and concrete, etc.</li> </ul>	<p><i>The economic activity manufactures one or more of the following products and their key components:</i></p> <p>(a) windows with U-value lower or equal to 1.0 W/m<sup>2</sup>K</p> <p>(b) doors with U-value lower or equal to 1.2 W/m<sup>2</sup>K</p> <p>(c) external wall systems with U-value lower or equal to 0.5 W/m<sup>2</sup>K</p> <p>(d) roofing systems with U-value lower or equal to 0.3 W/m<sup>2</sup>K</p> <p>(e) insulating products with a lambda value lower or equal to 0.06 W/mK</p> <p>(f) household appliances falling into the highest two populated classes of energy efficiency in accordance with relevant international or local labelling schemes</p> <p>(g) light sources rated in the highest two populated classes of energy efficiency in accordance with relevant international or local labelling schemes</p>

			<p>(h) space heating and domestic hot water systems rated in the highest two populated classes of energy efficiency in accordance with relevant international or local labelling schemes</p> <p>(i) cooling and ventilation systems rated in the highest two populated classes of energy efficiency in accordance with relevant international or local labelling schemes</p> <p>(j) presence and daylight controls for lighting systems</p> <p>(k) heat pumps that meet thresholds defined in M4.12 of this document</p> <p>(l) façade and roofing elements with a solar shading or solar control function, including those that support the growing of vegetation</p> <p>(m) energy-efficient building automation and control systems for residential and non- residential buildings;</p> <p>(n) energy-efficient building automation and control systems for residential and non-residential buildings</p> <p>(o) zoned thermostats and devices for the smart monitoring of the main electricity loads or heat loads for buildings and sensing equipment</p> <p>(p) products for heat metering and thermostatic controls for individual homes connected to district heating systems, for individual flats connected to central heating systems serving a whole building, and for central heating systems;</p> <p>(q) district heating exchangers and substations compliant with the district heating/cooling distribution activity set out in Section M4.11 of this document; products for smart monitoring and regulating of heating system, and sensing equipment.</p>
	6.7 Energy efficiency	6.7.1 Facilities dedicated to manufacturing and servicing of energy-efficient components. Facilities dedicated to manufacturing, installation, and servicing energy efficient appliances and equipment (e.g., fridges, cookers)	<p>Detailed technical screening criteria TBD.</p> <p>Household appliances falling into the highest two populated classes of energy efficiency in accordance with relevant local or international labelling schemes. Cooling and ventilation systems rated in the highest two populated classes of energy efficiency in accordance with relevant local or international labelling scheme.</p> <p>The energy efficiency of the energy-saving products should meet or exceed Level I of relevant local or international labelling scheme.</p> <p>Energy efficiency rating amongst top performers in the market.</p>
<b>Supply Chain Facilities</b>	6.8 Carbon scrubber Carbon	6.8.1 Facilities and products for cleanup, such as treatment of exhaust gases from industrial plants	Detailed technical screening criteria TBD



7. Water and Wastewater			
Macro Sector	Sub-Sector	Activity/Technologies Description & Examples	Metric / Threshold / Technical Screening Criteria PNG Agency Domain
Water and Wastewater	7.1 Water Monitoring	7.1.1 Smart networks, early warning systems for storms, droughts, floods or dam failure, water quality or quantity monitoring processes	<i>Direct eligibility</i>  <i>Water PNG Ltd</i>
	7.2 Water Storage	7.2.1 Rainwater harvesting systems, stormwater management systems, water distribution systems, infiltration ponds, aquifer storage, groundwater recharge systems, sewer systems, pumps, sand dams	<i>Detailed technical screening criteria TBD.</i>  <i>No net GHG emissions are expected, and the issuer discloses the justification for this decision with supporting documentation or</i> <i>Negative net GHG emissions are expected, and the issuer has estimated and delivered the GHG mitigation impact that will be delivered over the operational lifetime of the project or asset.</i>  <i>Water PNG Ltd</i>
		7.2.2 Construction of new drinking water supply infrastructure  Construction and operation of technically-advanced drinking water collection, storage, treatment and supply infrastructure that reaches at least 20% water savings per unit of service compared to a documented local baseline	<i>Direct eligibility</i>
		7.2.3 Retrofit of existing water supply infrastructure  Retrofit of existing water supply infrastructure that reaches at least 20% water savings per unit of service compared to a documented local baseline.	<i>At least 20% water savings per unit of measure compared to baseline</i>



	7.3 Water Treatment	7.3.1 Drinking water treatment, water recycling systems, wastewater treatment facilities, manure and slurry treatment facilities ecological retention systems, current force reduction mechanisms	<i>Direct eligibility or Agency approval</i>  <i>Water PNG Ltd</i>
	7.4 Water Distribution	7.4.1 Rainwater harvesting systems, gravity-fed canal systems, pumped canal or water distribution systems, terracing systems, drip, flood, and pivot irrigation systems	<i>Direct eligibility or Agency approval</i>  <i>Water PNG Ltd</i>
	7.5 Water Desalination	7.5.1 Seawater desalination plants and brackish water desalination plants	<i>Detailed technical screening criteria TBD.</i>  <i>Powered by renewable energy.</i>  <i>The average carbon intensity of energy used to power the plant must be at or below 100g CO2/kWh over the remaining lifetime of the asset.</i>  <i>Water PNG Ltd</i>
	7.6 Flood Defenses	7.6.1 Surge barriers, pumping stations, levees, gates	<i>Direct eligibility or Agency approval</i>  <i>Water PNG Ltd</i>
	7.7 Nature-based Solutions	7.7.1 Water storage from aquatic ecosystems, aquifer storage, snowpack runoff, groundwater recharge systems, riparian wetlands	<i>Detailed technical screening criteria TBD.</i>  <i>No net GHG emissions are expected, and the issuer discloses the justification for this decision with supporting documentation</i>  <i>OR</i>  <i>Negative net GHG emissions are expected, and the issuer has estimated and delivered the GHG mitigation impact that will be delivered over the operational lifetime of the project or asset.</i>  <i>Water PNG Ltd</i>



		7.7.2 Flood defenses by ecological retention, restoration of riparian wetlands, relocation of assets	<i>Detailed technical screening criteria TBD</i>
		7.7.3 Drought defenses by aquifer storage, recharge zone management, wetland management	
		7.7.4 Water treatment by natural filtration systems, forest, and fire management	
		7.7.5 Stormwater management by permeable surfaces, erosion control systems, evapotranspiration systems	
	7.8 Products	7.8.1 Water saving technologies	<i>Detailed technical screening criteria TBD</i>  <i>Water PNG Ltd</i>
	7.9 Wastewater	7.9.1 Wastewater treatment of major industries  Construction and operation of wastewater treatment facilities for major water-polluting industries, such as papermaking, coking, nitrogen fertilizers, non-ferrous metals, printing and dyeing, agricultural and sideline food processing, raw pharmaceutical ingredient manufacturing, tanning, pesticides, electroplating. Examples of this activity include the treatment of phosphate ore, phosphorus chemical industry, phosphogypsum storages, and comprehensive utilization and trading of phosphogypsum, and the construction and operation of wastewater facilities in industries containing phosphorus pesticides	<i>Meet local wastewater treatment standards</i>
		7.9.2 Portion of treatment of wastewater that reduces methane emissions	<i>Detailed technical screening criteria TBD</i>  <i>Only if net GHG emission reductions can be demonstrated and if not a compliance requirement to meet e.g., a performance standard or safeguard requirement</i>  <i>Water PNG Ltd</i>

	8.0 Composting	8.0.1 Facilities for the production of compost from organic waste	<i>Detailed technical screening criteria TBC</i>
		8.0.2 Catchment management  Low-carbon impact method of influencing raw water quality at its source by managing land use practices on a catchment scale	<i>Detailed technical screening criteria TBC</i>
		8.0.3 Recycling and treatment of packaging waste  Establishment and operation of recycling and treatment facilities for packaging wastes such as packaging containers and materials made from paper, plastic, metal, glass, wood, or mixed materials that comply with national standards	
		8.0.4 Solid waste collection and treatment of garbage generated in shipping vessels, yards and ports  Installation of solid waste collectors, receivers and treatment facilities for ports and marine terminals for the collection of garbage generated in shipping vessels, yards and ports	<i>Meet local waste treatment standards</i>



8. Pollution Prevention, Waste & Control			
Macro Sector	Sub-Sector	Activity/Technologies Description & Examples	Metric / Threshold / Technical Screening Criteria PNG Agency Domain
Air Quality	8.1 Air Pollution prevention and control	8.1.1 Air pollution management	<p><i>Detailed requirements, approvals, or technical screening criteria TBD.</i></p> <p><i>For brownfield sites, introduction of additional air-pollution management will qualify.</i></p> <p><i>The EU standard will normally be the benchmark. Greenfield projects will not normally qualify unless they go substantially beyond normal good practice standards for that industry.</i></p> <p>CEPA</p>
	8.2 Industrial pollution prevention and control	8.2.1 Industrial pollution prevention and control <ul style="list-style-type: none"> <li>Example: Industrial air pollution treatment facilities, exhaust gas, and effluent reducing and recycling facilities. desulfurization and denitration facilities, filter-bag, exhaust gas burner</li> </ul>	<p><i>Detailed requirements, approvals, or technical screening criteria TBD.</i></p> <p><i>Greenfield projects will not normally qualify under this category unless they go substantially beyond good practice standards for that industry.</i></p> <p>CEPA</p>
Solid Waste and Soils	8.3 Environmental remediation	8.3.1 Regeneration of contaminated sites, and disused brownfield sites	<p><i>Detailed requirements, approvals, or technical screening criteria TBD.</i></p> <p><i>Remediation must be associated with clear environmental benefits that result directly from the use of funds. Such benefits may include the removal or isolation of contaminants, or reduction in long-term risks to human health.</i></p> <p><i>Projects should normally be benchmarked to a recognized good-practice guideline or standard, such as the Dutch Target and Intervention Values, 2000 or similar ASEAN benchmarks or guides.</i></p> <p>CEPA</p>
		8.3.2 Rehabilitation and tailings management for abandoned mines	
		8.3.3 Soil remediation <ul style="list-style-type: none"> <li>Example: Facilities and infrastructure using soil remediation technologies and products for remediation of polluted or degraded soil</li> </ul>	
Preparation	8.4 Facilities for collection, sorting and material recovery	8.4.1 Facilities and assets with high recovery rates of reusable or recyclable material	<p><i>Detailed requirements, approvals, or technical screening criteria TBD.</i></p> <p><i>Made from 100% recycled and recyclable materials. Supports source segregation of waste.</i></p> <p>CEPA</p>

Waste Storage	8.5 Waste storage facilities	8.5.1 Storage and bulking facilities	<p><i>Detailed requirements, approvals, or technical screening criteria TBD.</i></p> <p><i>Dedicated to eligible waste processing asset(s) downstream. Those downstream assets do not need to be certified but do need to meet the criteria for that asset type. All waste stored must be transferred to those assets.</i></p> <p>CEPA</p>
Re-Use	8.6 Facilities for the re-use of materials	8.6.1 Facilities refurbishing or repairing products or cleaning components or products for reuse in their original function	<p><i>Detailed Requirements, Approvals, or Technical Screening Criteria TBD</i></p> <p><i>The products are put back to their original use without requiring any further pre-processing. For WEEE, the product is covered by an ecolabelling scheme and only those products meeting the three lowest energy use categories are eligible</i></p> <p>CEPA</p>
Recycling	8.7 Facilities for the recycling of materials	8.7.1 Facilities for recycling metals, plastics, glass (except aggregate), and paper	<p><i>Detailed requirements, approvals, or technical screening criteria TBD</i></p> <p><i>The secondary raw materials (such as steel, aluminum, glass, plastics) cease to be waste and are sold to be used as secondary raw materials</i></p> <p>CEPA</p>
Biological Treatment Facilities	8.8 Anaerobic digestion facilities	8.8.1 Facilities for the production of biogas from green waste	<p><i>Detailed requirements, approvals, or technical screening criteria TBD</i></p> <p><i>Total methane emissions <math>\leq 1285g CH_4/ton</math> of waste input. Woody waste must be segregated before or after processing and sent to an eligible EfW or composting plant. Monitoring, sampling, and control of the following is carried out in accordance with PAS110 guidance. The solid and liquid products are not landfilled and replace non waste materials in the market</i></p> <p>CEPA</p>
	8.9 Composting Facilities	8.9.1 Facilities for the production of compost from organic waste	<p><i>Detailed requirements, approvals, or technical screening criteria TBD</i></p> <p><i>Zero measurable methane emissions. Monitoring, sampling and control is carried out in accordance with PAS100 guidance. The resulting product is not landfilled and replaces non-waste material in the market</i></p> <p>CEPA</p>
		8.9.2 Sustainable supply-chain management activities that reduce environmental footprint, including ‘circular economy’ concepts	<p><i>Detailed requirements, approvals, or technical screening criteria TBD.</i></p> <p><i>Project will be expected to demonstrate a quantifiable reduction in resource or energy use compared with the pre-project baseline.</i></p>



	9.0 Eco-sanitation	9.0.1 Self-Contained and eco-sanitation toilet solutions for farms, rural green areas, tourist camps and small businesses  • Example: Installation of self-contained and eco sanitation toilets that contribute to soil pollution reduction. Examples of such toilets include composting toilets, container-based toilets, dry toilets, septic systems, UDDT	<i>Detailed Requirements, Approvals, or Technical Screening Criteria TBD</i>  CEPA
	9.1 Technology enabling the switch of Raw Materials	9.1.1 Toxic with non-toxic, virgin with recycled	<i>Detailed Requirements, Approvals, or Technical Screening Criteria TBD.</i>  CEPA
Waste to Energy	9.2 Waste to Energy plants (e.g. incineration, gasification, pyrolysis and plasma)	9.2.1 Facilities for solid waste treatment with production of electricity or heat as a by-product	<i>Detailed Requirements, Approvals, or Technical Screening Criteria TBD</i>  <i>Only facilities outside the EU are potentially eligible. Plant efficiency <math>\geq 25\%</math>; AND Bottom ash recovery; AND <math>\geq 90\%</math> recovery of metal from ash; AND Average carbon intensity of electricity and/ or heat over the life of the plant <math>\leq</math> waste management allowance; AND capacity of the plant does not exceed the calculated residual waste at any time in the plant's life</i>  CEPA
Landfill	9.3 Landfill with gas Capture	9.3.1 Projects to add gas capture to existing, closed landfill facilities	<i>Detailed Requirements, Approvals, or Technical Screening Criteria TBD</i>  <i>Biogas from closed landfill facilities. Gas capture <math>\geq 75\%</math>; AND gas used to generate electricity and input to the natural gas grid or used as vehicle fuel; and the landfill is not accepting further waste (with the exception of restoration materials)</i>  CEPA

9. Information & Communications Technology			
Macro Sector	Sub-Sector	Activity/Technologies Description & Examples	Metric / Threshold / Technical Screening Criteria PNG Agency Domain
Broadband Networks	9.1 Broadband networks	9.1.1 Fiber optic and cable networks	<i>Direct Eligibility or Agency Approval.</i>  <i>Cannot support increased emissions / environmental footprint.</i>  <i>ICT projects are typically more complex and would require an environmental impact assessment or expert opinion as there are no simple general technical screening criteria. However due to the broad benefits ICT projects bring to the economy in terms of digitalization, financial inclusion, disaster resilience, most ICT projects are accepted so long as the Do No Significant Harm principle is met.</i>
	9.2 Supporting infrastructure	9.2.1 Such as internet exchange points	
IT Solutions	9.3 Connectivity	9.3.1 Teleconferencing and telecommuting software and service	
	9.4 Data hubs	9.4.1 Including data storage centers	
	9.5 Supporting Infrastructure	9.5.1 Such as hardware and manufacture of hardware	
Power Management	9.6 Infrastructure, software, and hardware for remote power management	9.6.1 Remote solutions for appliance power management, and load-balancing of renewables Including automatic switching, energy monitoring & data systems	<i>NICTA/ Telecommunication Companies (Digicel/ Telikom/ Vodafone)</i>
	9.7 In situ power Management		





## 10. GHG Reductions and Transition Activities - Other

Macro Sector	Sub-Sector	Activity/Technologies Description & Examples	Metric / Threshold / Technical Screening Criteria PNG Agency Domain
	10.1 Fugitive emissions	10.1.1 Reduction of gas flaring or methane fugitive emissions in the oil and gas industry	<i>Detailed requirements, approvals, or technical screening criteria TBD</i>  CCDA/ CEPA
		10.1.2 Coal mine methane capture	<i>Detailed requirements, approvals, or technical screening criteria TBD.</i>
	10.2 Air conditioning and refrigeration	10.2.1 Retrofit of existing industrial, commercial, and residential infrastructure to switch to cooling agent with lower global warming potential	<i>Detailed requirements, approvals, or technical screening criteria TBD.</i>  CCDA/ CEPA
		10.2.2 Skills training and capacity building for EE/RE and climate related skills  • Example: Electric Vehicle Mechanics, EE Auditors, Environmental Engineers, EE/ RE Equipment installers and maintenance personnel, etc.	<i>Approval criteria TBC</i>

## 11. Disaster Resilience, Recovery and Climate Change Adaptation - Other

Macro Sector	Sub-Sector	Activity/Technologies Description & Examples	Metric / Threshold / Technical Screening Criteria PNG Agency Domain
	11.1 Mobile Payments System	11.1.1 Mobile payments system	<i>Detailed requirements, approvals, or technical screening criteria TBD</i>  <i>NICTA/ Telecommunication Companies</i>
	11.2 Emergency Power and Communication System	11.2.1 Emergency power and communication system	<i>Detailed requirements, approvals, or technical screening criteria TBD</i>  <i>NEA/ PNG Power Ltd/ NICTA</i>
	11.3 Climate Insurance	11.3.1 Climate insurance	<i>Detailed requirements, approvals, or technical screening criteria TBD</i>  <i>CCDA/ CEPA</i>
	11.4 Disaster Resilience and Adaptation activities focused on Women	11.4.1 Disaster resilience and adaptation  Section to be updated once National Adaptation Plan is published.  <ul style="list-style-type: none"> <li>Example: Adaptation measures which slow-onset disasters; not only rapid-onset disasters. Such as coastal protection, coastal retreat, coral reef and mangrove expansion (both coastal protection and fisheries breeding grounds / food security), landscape protection (e.g. to protect against landslips), flood protection (e.g. drainage improvements). Such adaptation measures will especially include activities that are focused on women.</li> </ul>	<i>Detailed requirements, approvals, or technical screening criteria TBD</i>  <i>CCDA/ CEPA</i>

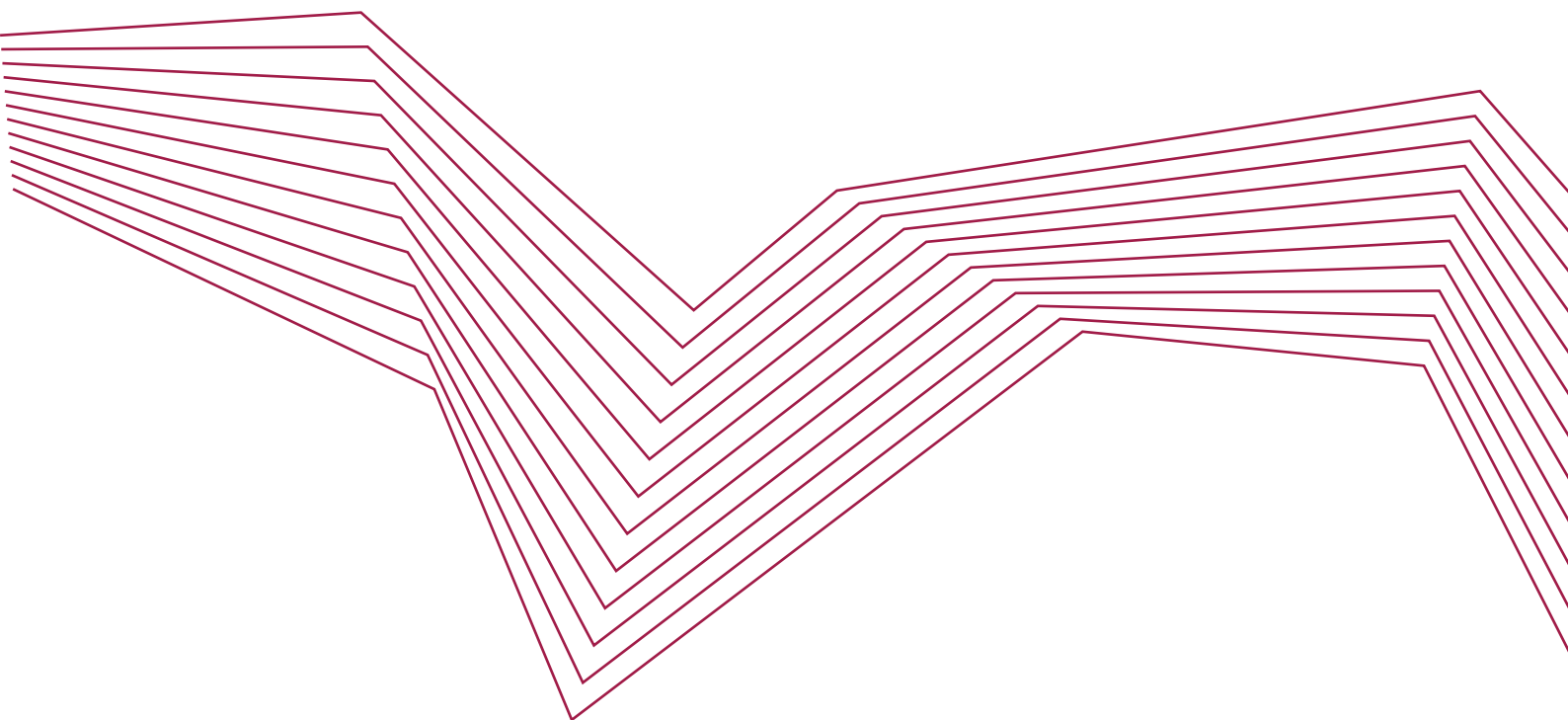


BANK OF PAPUA NEW GUINEA

# **Diagnostic Report on the State of Inclusive and Green Finance in Papua New Guinea**



## **2. Diagnostic Report on the State of Inclusive and Green Finance in Papua New Guinea**



## 2.1. Summary

This diagnostic report contributes to the development of the Inclusive and Green Taxonomy and Implementation Roadmap for the banking sector in PNG. The main purpose is to provide a straightforward overview of the financing ecosystem to answer the key questions: How is PNG doing in terms of Inclusive and Green Finance? What are the facilitating factors and the obstacles in financing inclusive and green activities and projects?

Hence, the goal of the project team was to quickly review information about the financial sector's supply and demand drivers and stakeholders (customers, suppliers, practices, goods and services, etc.) and provide a concise report with conclusions that can help provide future direction to the drafting of the taxonomy and roadmap. The intended users of the taxonomy are (i) PNG's financial sector stakeholders – regulators, banks, microfinance institutions, and saving and loan societies – who are being encouraged to channel more domestic finance towards inclusive and/or green projects, and (ii) supporting organizations such as the Centre for Excellence in Financial Inclusion (CEFI). It is also expected that the taxonomy will facilitate the inflow of international finance to support PNG's climate and other sustainability-related objectives.

The development and effective implementation of the taxonomy requires a solid foundation (i.e., laws, regulations, policies, practices, institutions, expertise, digitalization, etc.) and wide-ranging market knowledge which is data-driven. Likewise, the findings and conclusions of a diagnostic, or any intervention for that matter, should be based on data. Regrettably, market data in general in PNG is a very scarce commodity. Rather than being able to rely on data from the statistical office, central bank, the financial institutions operating in PNG, and sources such as government agencies and donor institutions, we were compelled to take a different approach in drafting this report. Since there is little data available on FI's loan portfolios, FI loan clients, and other key driving factors around inclusive and green finance, we base our findings and recommendations mainly on one-on-one interviews with knowledgeable stakeholders from PNG – members of the Steering Committee (SC) and Technical Working Group (TWG) as well as other key market experts and government representatives – and international best practices from more developed countries.

As per the terms of reference of this project, the primary focus area was the financial sector. Regrettably, there is little to reflect on because financial institutions mostly do not disclose relevant information in their annual reports. None of the banks offer special loan products which target even simple activities which support environmental efforts, starting from, e.g., the purchase of solar lanterns and up to investing in energy efficient machinery and equipment. The banks and MFIs interviewed do not track the specific purpose of a loan in their Management Information System (MIS) other than if the loan is for working capital or capital expenditure. The sector-disaggregated portfolio data which is available about lending in PNG vaguely suggests that only a very small proportion of lending is allocated to activities that would potentially qualify as inclusive and/or green finance.

Additionally, MFIs and savings and loans societies have a very small share in the overall savings and credit portfolio of PNG's financial sector, and all information we were able to obtain – admittedly scarce – suggest they are not active in the sectors of interest, i.e., those that would be classified as green and/or inclusive. That said, these institutions could, in the near future, play a role, e.g., replicating models from other countries regarding saving, lending, and payment systems for small solar-powered or energy efficient household appliances, green building material, or energy efficient machinery.

Our desk research indicates that three of the four commercial banks have fairly well developed Environmental and Social Management Systems (ESMS); however, the two international banks have not applied them to their PNG subsidiaries to date. ESMS include strategies, policies, and tracking and reporting of inclusive and green finance – discussed later in this report.

Finally, the overall commercial market for inclusive and/or green investments in PNG is very small, as is the awareness among consumers and MSMEs. For the easily discernible market which does exist, such as PV installations or other small-scale renewables, there is minimum to no data (there is no central database of climate mitigation or adaptation projects). FIs, due to their limited MIS, cannot identify loans which could potentially be financing inclusive and/or green projects. Even donor-funded climate projects require extensive time and effort to discover across websites or press releases. The entire ecosystem for green investments is, as our interviews and research have indicated, very weak. So, the scale up of private investment in inclusive and green projects will require interventions on many dimensions and systemic changes, beyond just making loans available. Catalyzing commercial finance into activities which reduce environmental impacts of commodity driven sectors and deforestation, to mitigate emissions, and to adapt infrastructure to climate change will require a demand driven approach. The challenge is how to effectively influence market stakeholders' decision to invest in sustainable projects, activities, sources and supply chains. However, any change in sustainable finance regulations and guidelines requires comprehensive efforts and clearly articulated incentives and penalties to promulgate Environmental, Social, and Governance (ESG) standards. Lack of capacity and experience inhibits banks from anchoring ESG-related opportunities in finance products that both safeguard environmental stability and generate profit.

## 2.2. Purpose and perspectives

### 2.2.1. Detour: Purpose of and perspectives on Inclusive and Green Finance

Financial inclusion refers to providing greater access to financial services for poor and low-income individuals as well as businesses with limited resources. The objective is for individuals and MSMEs to have access to useful and affordable financial products and services that meet their needs – transactions, payments, savings, credit and insurance – delivered in a responsible and sustainable way. It is typically measured along three dimensions: (i) access to financial services, (ii) usage of financial services, (iii) quality of the products, and (iv) the service delivery. The rise of fintech is also considered a major contributor to increased financial inclusion.

Green finance is defined as a loan or investment that supports an environmentally friendly or sustainability-aligned activity, such as purchasing environmentally friendly and energy efficient goods and services or building environmentally friendly infrastructure such as renewable energy power plants. We should not confine green projects only to solar or wind energy, however. Sustainable land use, water and urban waste management, green buildings, clean transportation, pollution prevention and control systems, and energy efficiency projects are some of the areas that are globally eligible to receive green financing.

Green finance ensures that current and future financial risks and opportunities from climate and environmental factors are integrated into mainstream financial products, services, and decision making, and that markets for green financial products are robust in nature. Green finance helps accelerate finance to support the delivery of PNG's NDC targets and clean growth, adaptation, resilience, and environmental ambitions, as well as international objectives. For the banking sector, green finance comprises all forms of investment or lending that take into account environmental impact and enhance environmental sustainability. The green financial products and services consider the environmental factors throughout the lending decision making, ex-post monitoring and risk management processes, provided to promote environmentally responsible investments and stimulate low-carbon technologies, projects, industries and businesses. Climate finance is merely one aspect of green finance, which is particularly focused on adaptation to the impacts of climate change or the reduction or limitation of greenhouse gas emissions.

Financial inclusion and green finance are frequently treated as two distinct concepts in policy discussions and in financial regulation. But there are considerable overlaps in the goals of financial inclusion and green finance. Combining the two concepts under one policy (or framework) allows policymakers and financial service providers to better focus on and deliver activities which lead to a transition to an inclusive, sustainable, and resilient economy. Inclusive and Green Finance (IGF) combines the concept of green finance and financial inclusion policies and regulations to develop integrated inclusive green finance policies and actions. It makes use of the financial products and services, including digital finance, to mitigate the shocks from climate change, thus enhancing the resilience of the vulnerable populations and sectors against the climate related adverse events. Financial policymakers and regulators are now beginning to understand and acknowledge the interlinks between green finance and financial inclusion and the role that financial inclusion plays in helping vulnerable communities build resilience and mitigate current or potential losses caused by climate change.



Banks, MFIs, and other lending institutions are in business to make a reasonable return for their shareholders (or in the case of MFIs, at least a minimum profit to sustain their operations) and play an important role in enabling economic (ideally green) growth through the loans and payments services they provide. Banks take customer deposits, in return customers obtain interest payments for the usage of their money. Then, banks use the majority of deposits to lend to other customers (individuals and businesses) for a variety of loans. The difference between the two interest rates is effectively the profit margin for banks. This intermediation plays an important role in the economy for offering a service for people wishing to save and by offering finance to individuals and businesses who wish to invest and expand or purchase assets or pay for various expenses in instalments.

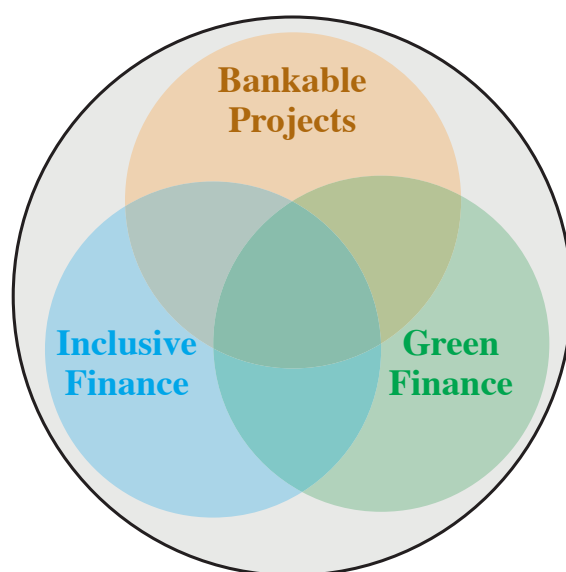
Banks have a fiduciary and regulatory duty to protect the savings of their customers. Banks are naturally selective in the projects they lend to. If they make too many bad loans, they will imperil their customers deposits or even the financial system. Bankable projects, therefore, involve a solid financial, economic, and technical plan. All loans include a risk allocation scheme appropriate for the nature of the project. The bank assesses risk based on the profile of the client and knowledge of the risk profile of projects or activities across different economic sectors. The risks involved and the interests of the lenders implying an acceptable credit risk. Which is why lenders believe that a project is bankable if the project (for an individual or company) has the ability to service the principal and interest payment – to repay the loan on the agreed terms and conditions of the loan.

When financing a “green” investment, a lender, in addition to standard credit checks, will typically look at the following when assessing whether to take on the risk of loan to a client who is purchasing, for example, new energy efficient (EE) machines:

- Is the project or activity a known and proven technology?
- Is it used by others successfully?
- Is it built or sold by a creditworthy firm?
- Are the supplier or vendor warranties creditworthy?
- Can the equipment be properly serviced?
- Is the owner/operator experienced in the sector or with the particular technology?
- Is the client financially viable?

We can see that many considerations go into determining whether a project is bankable or not. The lender has to have trained staff who are familiar with a sector, type of technology or activity being financed, data on the repayment history of the client, collateral valuation, etc., and who can combine these variables to properly assess the risk and then determine if the risk level is acceptable to the FI. In some ways the bank will decide what qualifies to be a bankable project – after all, the bank provides the funds and should be considered as the co-owner throughout the tenure of the loan.

So, when looking at what will be the total addressable market for inclusive and green loans, we cannot ignore the topic of bankability, just as we cannot have bankability be the first and absolute test to be satisfied before considering whether a project/activity is inclusive and/or green. Of the market for all potential projects and activities, not all projects or clients will be bankable. Just as not all inclusive projects are green and not all green projects are inclusive. Therefore, what will be of interest from the perspective of domestic finance and qualify as green and inclusive, will be a smaller segment of the overall market for bankable projects.



Bankability is not meant to be a prerequisite or a tool to rate projects. Rather, it provides an entry point for stakeholders – lenders, borrowers, regulators, and policymakers – to discuss the obstacles, challenges, and barriers to lending to inclusive and/or green projects at scale, such as lack of underwriting skills by loan officers or lack of market information and project performance to price or assess risk by the credit risk departments. These could be major weaknesses to be remedied in the banking sector. A discussion of bankability will thus help us understand what banks will likely finance at the current or near term state – at what level can we expect domestic institution to contribute to funding projects – once the taxonomy tool to identify green is in place. But more importantly the discussion can help us understand and mark interventions targeted at the financial sector to break down barriers and release more funding. It helps assess the effort needed to remove friction on the financing supply side.

We have determined that the current status of green finance by domestic FIs in PNG is negligible – or at least undeterminable since it was not being tracked and cannot be extracted or derived from current FI portfolio data. We also do not know what the estimated real demand (number and estimated cost) for projects is – there is no aggregate register of planned climate mitigation and adaptation projects other than the estimates used for the NDC Implementation Plan. There is also difference between market needs, estimated market size, and total addressable market for private sector financial institutions. Once the taxonomy is in place and mapped against the NDC and NAP Implementation Plans, it might be feasible to estimate the potential market size and apply a bankable project ratio to determine an addressable market for FIs to pursue.

At this early stage of implementation of taxonomies worldwide (e.g., Mongolia, one of the first movers, has compiled green loan data from 2020), we have learned that approximately 2% of total bank loan portfolios are aligned with their green taxonomy.

## 2.2.2. Climate finance and taxonomies

Impacts related to climate change have no borders. People need financial security as well as secure and resilient working and living environments. That is why climate change mitigation and environmental protection are among the most pressing tasks when it comes to development cooperation. There is an opportunity to deliver improved social, environmental, and economic outcomes for people, including support to job creation and more resilient communities, as well as a cleaner and healthier environment. Investments in climate mitigation and adaptation measures are essential and factors such as strong domestic financial markets and access to green finance play a key role and contribute to the “greening” of economic activities and living conditions worldwide.

Green finance thus encompasses:

- a) Financial services, particularly credit, for sectors that are driving the ‘greening’ of the economy; examples are renewable energy generation, eco-tourism, e-mobility; and reduction of exposure to excessively resource- or emission intensive sectors, e.g., charcoal making, fossil fuels.
- b) Assessment of environmental effects – i.e., how resource-intensive or how GHG’s emission-intensive is an economic activity – of financial services, particularly credit;
- c) Credit for the purpose of reducing resource-use, pollution, or emissions of given economic activities; examples are expanding renewable energy production, implementing energy-saving measures, reducing waste (e.g., smart agriculture), strengthening ecosystem services (e.g., biodiversity)

The above list represents increasing complexity from a) through b) to c). The difference between a) and b) is pragmatic. It can be a starting point for a financial institution to favour certain broadly defined sectors or to avoid others, but it is not very consistent methodologically. For instance, would all timber-logging be considered excessively resource-intensive or environmentally harmful to natural habitats and biodiversity? If a company has a protocol or certification that its timber-logging operation is sustainable, should it not be eligible?

For this reason, a more rigorous system is needed to define what type of project or activity qualifies as green. A green taxonomy fills this purpose. An Inclusive and Green Taxonomy is basically a classification system, establishing a list and definitions of environmentally sustainable and inclusive economic activities. The word “taxonomy” literally means naming and classifying something. Like any classification system, it has definitions and rules. The taxonomy, therefore, is a tool for determining whether an activity or financial asset can be considered inclusive and/or green and provides the required definitions, classifications, regulations and guiding principles to separate sustainable projects from those that go against the objectives and targets in the government’s sustainability-related policies, strategies, and workplans.

The taxonomy translates a country’s international climate and environmental objectives into criteria for specific economic activities for lending and investment purposes. It classifies sustainable economic activities from an environmental perspective as inclusive and/or green economic activities. The taxonomy defines environmentally sustainable activities as economic activities that make a substantial contribution to at least one of the environmental objectives (see below), while, at the same time, not significantly harming any of these objectives and meeting minimum social safeguards.

A taxonomy broadly has the following environmental objectives:

- Climate change mitigation
- Climate change adaptation
- The sustainable use and protection of water and marine resources
- The transition to a circular economy
- Pollution prevention and control
- The protection and restoration of biodiversity and ecosystems

The taxonomy is structured based on the Standard Industrial Classification. Each sub-sector/group/business activities are further defined through technical screening criteria. Thus, a taxonomy is important because it can provide a better common understanding for banks and MFIs and facilitate them in the classification of green business activities and investments within the development of their financial product and/or services portfolio. It is important to highlight that the taxonomy is meant to be a living document which also opens up some room for sectors/groups/business activities not yet listed to be added based on clarifications from the relevant ministries, technical working groups, and international best practices.

A taxonomy is expected to also help the periodic monitoring process in the implementation of credit/financing/investment into the green sector and prevent the potential reporting of non-green activities (greenwashing).

Since there are limitations of a pragmatic approach, both in terms of environmental impact and in terms of value-based message that the FI sends. There is an inevitable need for a more rigorous method of identifying and managing of green finance activities systematically through a Green Taxonomy and an Environmental and Social Management System. Table 1 provides an overview of the key elements of the ESMS, which can be understood to be the tools to operationalise b) and/or c) mentioned earlier.

**Table 1: Key elements of ESMS**

Key element of ESMS	Description
E&S policy	The E&S Policy is a brief declaration of an organization's commitment to sustainable development and management of E&S issues, including health and safety requirements. It is communicated at least internally and mostly disclosed publicly. The policy should be fully supported by the management and launched by them.
E&S procedures	The procedures detail how the organization addresses E&S and sustainability issues as part of its investment operations. They are normally step-by-step instructions focusing on what needs to be done and by whom at various stages of the investment cycle (including supervision). Reference is often made to guidelines. Procedures may be stand-alone or constitute part of the credit or other operational procedures of the institution. They should be documented and communicated to ensure that all existing and new staff are aware of the process. Regular trainings shall be performed to make responsible staff familiar with the respective procedures.
E&S guidelines	These provide guidance to responsible staff on how to carry out the various steps outlined in the E&S procedures and on what to look for when conducting an E&S review. They might encompass useful tools, e.g. checklists or questionnaires. The guidelines can be simple for low risk investments and more sophisticated for high risk investments.
Recordkeeping	This is a vital aspect of an ESMS that ensures that the review and analysis conducted and the required mitigation or corrective measures as applicable according to the Procedure are recorded in the credit decision documents.
Capacity and resources and training	Additional responsibilities for E&S risk management should be assigned to existing staff or new staff should be hired as required by the ESMS. A financial institution's staff with designated responsibilities under the ESMS shall be trained, and is then required to follow the necessary procedures in their day-to-day tasks related to risk management at all stages of the transaction appraisal and monitoring process.
Review and continuous improvement	Throughout implementation and subsequent operation of the ESMS, the ESMS should be reviewed periodically to ensure that its procedures remain relevant to the level of E&S risk associated with the institution's portfolio. This will ensure that new and emerging E&S risks are detected and identified during the environmental and social due diligence (ESDD) process. Any potential difficulties and opportunities for improvement should be identified by staff and addressed in a timely manner by the ESMS Officer and concerned staff to ensure a smooth implementation and efficient operation. The operations manual (Procedures) for the ESMS should be updated regularly to reflect any changes and new requirements in the E&S regulations and/or international best practices that affect the business operations of an institution's clients/investees.
Categorization	To ensure that the extent of the review is commensurate with the nature of risk, categorization is a useful step in procedures: Based on basic information about a project such as sector and scale, the level of the project's possible E&S risk is determined. This also enables the financial institution to determine the extent and sophistication of the subsequent E&S review. Examples of categorization are High, Medium, and Low risk.
Stakeholders' engagement and communication	The FIs will require the subproject to conduct stakeholder engagement in a manner proportionate to the risks and impacts of this subproject, and which reflects the type of subprojects it will finance. Finally, the FIs shall put in place procedures for external communications on environmental and social matters, proportionate to the risks and impacts of the subprojects, and the risk profile of the overall portfolio. The FIs will also respond to public enquiries and concerns in a timely manner. If necessary, the FI shall establish a grievance mechanism.

## 2.3. ESMS of banks operating in PNG

Only four private commercial banks are currently operating in PNG (see Annex 3).

The two international banks – Westpac Bank (PNG) Ltd. and Australia & New Zealand Banking Group (PNG) Ltd. (ANZ) – do have clearly structured ESMS which are reported annually across processes, resources dedicated and outcomes. However, these ESMS do not apply, as far as traceable from the reports, to their PNG subsidiaries, or at least they do not differentiate by different countries of operation.

Kina Bank's holding company, Kina Securities, which also owns MiBank, an MFI, reports on corporate social responsibility under a 'total societal impact strategy'. Most of the activities and initiatives reported are in the areas of social, gender, health and education sectors.

Regarding ESMS, they report : "The practical application of the E&S policy is an assessment tool for our lending and credit teams. The tool will be used across credit-related products in reviewing environmental and gender aspects of our current and perspective customers. We have trained 60 credit and lending specialists in the assessment framework with a continued educational program being implemented in 2022. The ESMS will be integrated into our annual credit review cycle to ensure compliance with the policy."

PNG's largest bank is Bank South Pacific (BSP). It also reports on CSR activities, which include one environmental initiative, namely support to the 'Go Green Campaign'. This represents about 8% of their CSR-spending in 2020, and the other 92% go into social, gender, health and education sectors. BSP notes in its annual report that their credit business unit is in charge of environmental and social risk management, and its whistle-blower policy covers 'environmental damage'.

We did not find information about ESMS for PNG's National Development Bank (NDB).

In summary, three of the four banks in PNG do have capacity to operate a sound ESMS and subsequently to report on the proportion of green finance provided.

<sup>1</sup> [https://investors.kinabank.com.pg/FormBuilder/\\_Resource/\\_module/n3fyS58U7kCjX2Pn-l57KA/doc/annual%20reports/Kina\\_AR\\_2021.pdf](https://investors.kinabank.com.pg/FormBuilder/_Resource/_module/n3fyS58U7kCjX2Pn-l57KA/doc/annual%20reports/Kina_AR_2021.pdf), date accessed 12/5/22

## 2.4. Green finance portfolios

There is no consistent information about the environmental and social effects of finance provided by these banks or other lending institutions in PNG. From their annual reports, we have extracted some sectoral information which gives initial information. Subsequently, we also discuss some qualitative sector information.

### 2.4.1. Sectoral credit portfolio

As stated in the inception report, there are eight sectors which are most relevant for ‘greening’ credit portfolios in PNG (Table 2). Financial services to these sectors can qualify as ‘green finance’ either by increasing exposure – e. g. renewable energy, smart agriculture – or by decreasing exposure – e. g. non-certified forestry or mining activities – or by nudging borrowers to invest in improved resource-efficiency and reduction of emissions – e. g. financing of tourism to be linked to use of renewable energy, sustainable waste management etc.

**Table 2: Opportunities for green finance by economic sectors**

Economic Sector	Potential to deliver on environmental objectives of PNG
Agriculture	Banks could finance sustainable agriculture, to be defined based on principles of climate smart agriculture; NDC includes oil palm, cacao, and coffee as climate-friendly
Aquaculture and fishery	Banks could finance sustainable aquaculture, although sustainability will be hard to define
Forestry	Banks could finance introduction and/or maintenance of shade trees for coffee and cacao plantations; also development of sustainable tree plantations, i. e., providing inputs for timber-based value chains
Tourism	Banks could finance tourism activities that do not have a significant detrimental effect on the environment
Renewable energy	Banks could co-finance installation of solar, wind, and hydropower projects
Mining	Banks could finance investments that reduce ecological impacts of mining, such as increased efficiency of land use, reduced waste production, and importantly proper and safe waste storage
Pollution prevention and control	Banks could finance equipment that reduces emissions/emission causing air pollution or worsening climate change (greenhouse gas) at factories and other sites. In conjunction with renewable energy, banks could also finance electric vehicles to reduce emissions from transport activities
Waste management and recycling	Banks could finance equipment that reduces solid and liquid waste at factories and other sites, provided there are public finance, policies and other means which enforce/support this function.



Information on funding is available for two of the above identified eight sectors. We further list transport, manufacturing and construction for two reasons: On the one hand, these likely include most of the above mentioned sectors (renewable energy, pollution prevention, waste management, to some extent renewable energy). On the other hand, they cut across activities relevant to those sectors, e. g. energy-efficiency in construction, waste management/ pollution prevention in transport and manufacturing).

Table 3 presents the proportion of the listed sector in all private sector credit in that year for BSP and Kina Bank. Together, these two banks represent close to 60% of all bank credit in PNG. Together, the sectors of interest amount to almost a quarter of all private sector credit, the other three quarters go to services and private households. This means of course that the proportion of the sectors of interest is lower than one quarter of all private sector credit.

**Table 3:** *Proportion of selected sectors in bank loan portfolios*

Sector	2020	2021
Agriculture	3.1%	2.4%
Mining	0.1%	0.1%
Construction	9.3%	6.7%
Transport & communication	8,3%	9.5%
Manufacturing	2.7%	2.5%

**Source:** *Banks' annual reports*

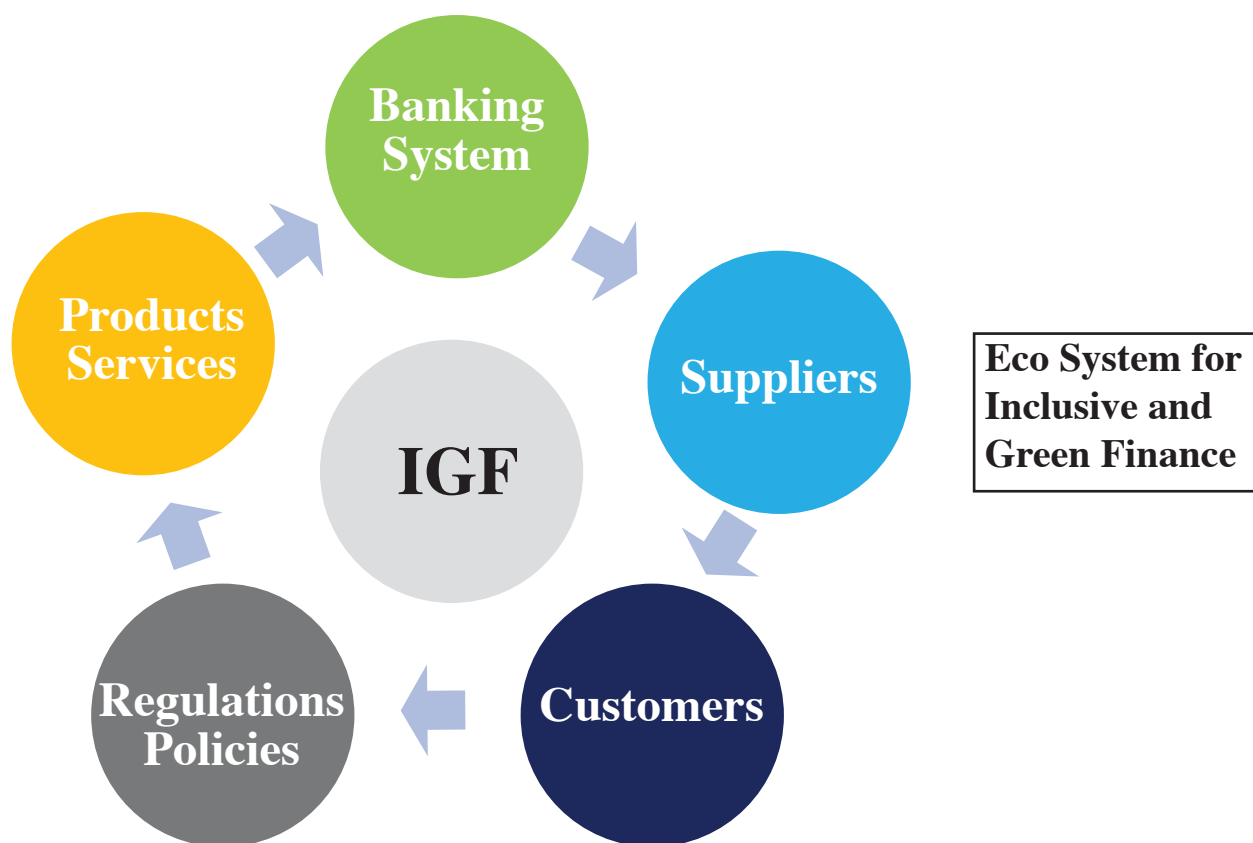
The NDB had a loan portfolio of close to PGK 300M in 2018 – the latest year for which they shared an annual report (through their website). Their website states that they have credit schemes for aquaculture and for tourism; however, detailed information about these schemes were unavailable.

## 2.5. Supply and demand for Inclusive Green Finance

According to PNG's Revised Enhanced NDC 2020 Implementation Plan, funds in excess of \$1 billion will be required over the next 10 years to meet PNG's NDC targets (\$500 million for AFOLU NDC Implementation, \$250 million for Energy NDC Implementation, and \$250 million for Adaptation). PNG's CCDA is working, in partnership with other key government agencies, in particular DNPM, as well as international partners towards the development of a clear financing plan for climate action. The level of funding needed is appreciably in excess of what the domestic FIs can provide – comparing to the current loan book of PNG's FIs. Green bonds, public-private partnerships, and other blended finance mechanisms will need to be employed to scale domestic FI funding for climate projects. The bulk of the resources however will need to come from international development partners.

In terms of smaller projects and involvement of domestic FIs in direct lending for green project developers or sponsors, the funding will largely depend on the functioning of the domestic eco system. In the sections below we analyze the drivers at play.

The market for inclusive and green finance depends on first the supply and demand for green equipment, material, and activities and then on the supply and demand for finance. The supply and demand dynamics is driven by the ecosystem for inclusive and green finance. We looked at five primary factors which constitute PNG's ecosystem for inclusive and green finance and the data which ideally would be required for each factor in order to deepen the understanding of underlying market forces.



In the following section, we take a look at each factor individually and consider the type of data which should be looked at when examining the impediments and facilitators in the ecosystem. We understand that most of the recommended data is not available, however, over the long term, CEFI, the BPNG, and the banks should be encouraged to collect this data by conducting their own primary research in order to understand the market dynamics and more accurately pinpoint where the opportunities lie. We need to keep in mind that some data is better than no data, but incomplete data can lead to the wrong strategies and actions.

### 2.5.1. Customers

Here we list the data and market intelligence which the FIs and CEFI should be looking at in order to understand the end-clients and their willingness to buy or invest - the households and MSMEs which will potentially be interested in investing in green activities. Without this knowledge, it's difficult for FI to design loan products and assess whether a certain market segment is large enough and is worth pursuing. Climate and energy intensity data by industries will also help FIs target the right industries.

- Number of registered businesses (by Industry Sector)
- Number of registered businesses by size
- Location of businesses
- Number of businesses with a loan (by gender/size, geocode)
- Number of businesses which pay taxes
- Number of households
- Average income per household
- Number of houses (geocoded)
- Clearly defined at risk houses/businesses/activities
- CO2 emissions by sector
- Biggest CO2 emitters
- Biggest polluters
- Number of grid-connected houses/businesses
- Number of houses/businesses with RE installed
- Number of licensed RE producers/installers/service providers
- Average energy use by household (by fuel type)
- Average energy use by business (by fuel type)

### 2.5.2. Suppliers

Suppliers are the local vendors and importers which supply the machines, equipment, materials, etc., which are necessary to make green investments. The availability of reputable and knowledgeable suppliers is quite important in meeting client requests for information and facilitating transactions. Banks will hesitate financing capital expenses if there are risks in dealing with unprofessional or unscrupulous sellers of equipment.

- Number of Suppliers of EE/RE Equipment and Material
- Number of Green Building Material Suppliers
- Suppliers of HH Appliances (Refrigerators, AC, Stoves etc.)
- Number of Importers
- Industry Associations
- Number of Solar Installers
- Number of trained or certified technicians for different types of equipment

### 2.5.3. Government policies and regulations

Government policies and regulations, assuming they are enforced, can have a significant impact on the ecosystem. They create an enabling environment. The numerous government policies, strategies, and action plans help point FIs in the right direction. The FIs can help, for example, MSMEs meet performance standards or energy efficiency requirements. A tax system which provides incentives for climate investments can be leveraged by FIs and reduce risk in projects. Thus the FIs must stay abreast of all leading regulations which impact consumers and MSMEs and understand which policies can be leveraged and which will impede the viability of projects.

- Policies
- Taxes
- Government Subsidies & Guarantees
- Custom Duties on EE/RE Equipment and Materials
- Permits
- Environmental Standards (Emissions/Pollution)
- Effectiveness of Institutions such as Environmental Protection or Building Permits
- Performance Standards
- Certifications
- Non-Financial Disclosure by Listed Companies

### 2.5.4. Products and services

With the arrival of the internet and on-line sales, much of the product research and purchases can be done on-line by clients. But in many cases, it's preferable, especially for appliances, smaller industrial equipment, and building materials, to be able to physical inspect the goods before making a purchase and having the option available to be able to purchase immediately. The more of this inventory is available locally at the vendors/stores/warehouses, the easier it is to clients to make a decision and transact. For services, it's critical that local licensed, trained, or certified installers and maintenance technicians are available.

- Equipment Available on local market (especially for small manufacturing by MSMEs)
- Material Available (especially EE building materials)
- Final Price of Green Equipment/Material
- Service Providers
  - ▶ Installers
  - ▶ Maintenance
  - ▶ Energy Auditors
  - ▶ Energy Audit Companies

### 2.5.5. Banking system

Banks are a key facilitator in promoting and financing a paradigm shift towards a low-emissions economy and climate resilient development pathways. In order to assess the impact of FI lending, more detailed portfolio data is needed. We recommend that the FI consider including more information about the purpose of the loan in MIS. Ideally green loans should be identified as such in the loan tracking system. Data reported to the Central bank should also be more detailed to assess the level of activity; for example, in the MSME segments. Central Bank aggregate reports would assist the market participants in better understanding the scope and size of the market and hence develop appropriate strategies. A deeper understanding of the underwriting requirements and risk assessment tools (and their weaknesses) of banks would contribute to identifying friction or barriers which can impede lending to green projects. Finally, banks need to start making preparations for ESG and Green Asset Ratios disclosures, these are impending global trends and regulatory requirements in developed markets.

- PNG loan book
  - ▶ Purpose
  - ▶ Loan description captured in MIS
  - ▶ NPL's by sector/sub-sector
- Number of Loans to Businesses
- Number of Loans to SMEs
- Number of Loans to Individuals
- ESG Disclosure Standards or Impact Reporting
- ESMS and compliance staff

### 2.5.6. Summary of interviews with stakeholders

In the absence of hard market data, we conducted our own reviews, site visits to a sample of vendors, and we conducted interviews with stakeholders (Annex 4) to gain additional insights on the PNG's ecosystem for green finance. We attempted to look at the market through the eyes of the customer and through the eyes of the banker. We fully understand that some conclusions or comments by stakeholders might not be accurate, but they still represent perceptions of the ecosystem.

Below is a summary of the key findings and observations – these include our own views as well as the views and opinions of the interviewed stakeholders.

- Very little data on actual green activities in PNG
- No common or aligned green metrics across various PNG policies and strategy documents
- PNG policies and strategies provide little quantifiable guidance on specific activities and plans – no clear baseline data, annual expected outcomes, etc.
- Agencies appear to be underfunded
- Important climate-related action plans/policies are missing or just now being drafted, e.g., RE licensing Policy (off-grid), Energy Efficiency Directive, EE Labeling, Green Building code, etc.
- Lack of incentives to engage in climate-friendly activities

- Awareness and understanding of environmental issues is very low across most stakeholders, sectors – leading to low prioritization and thus low demand
- Pollution and environmental monitoring and enforcement low – results in low demand for environmental tech.
- PNG reliant on brown industries and exports (Mining, LNG, Palm Oil)
- Deep market obstacles (tax system, customs, transport, FX rationing) – resulting in high cost of EE/RE/Green equipment and activities
- Banking system not tracking basic climate or green activity loan data needed to identify green loans
- Narrow bankable sectors – Agriculture finance just starting
- Lack of expertise on the market – ex. Energy Auditors, Equipment Service providers, vendors, etc.)
- High Poverty Level and Poor Living Conditions – Lead to other priorities by households, farmers, MSMEs, etc.
- Lack of Technologies on the market – Vendors, Experts, Consultants, etc. – ex. Agriculture technologies, practices, etc.
- Lack of Client Facing Resources – How to Guides, Information portals, Workshops, etc.
- Lack of International Best Practices / Lessons Learned - Taxonomies just now being implemented – Expectations vs Reality
- Lack of Industry Data and Baselines
- Donor Silos
- Little interactive dialogue between banking sector and climate policy public sector – especially no environmental data dialogue

## 2.6. A brief reflection on gender

Noteworthy, initiatives aimed at improving gender-equality are prominent among the CSR-activities reported by BSP and Kina Bank. There are also several initiatives for access to finance for women in various value chains, through women-owned cooperatives or women-focused MFIs, etc.

This is motivated by the poor standing of PNG in terms of gender-equality. Papua New Guinea has a GII value of 0.725, ranking it 161 out of 162 countries in the 2019 index.

Policy research shows a close link between gender-equality and environmental outcomes. An Inclusive Green Finance Policy has to carefully build this in, given the context of PNG. It can build on some of the initiatives and might e. g. expand financial (and other) literacy training to include modules on important practical issues of using resources carefully (e. g. household and small enterprise water or waste management) and benefit from it.



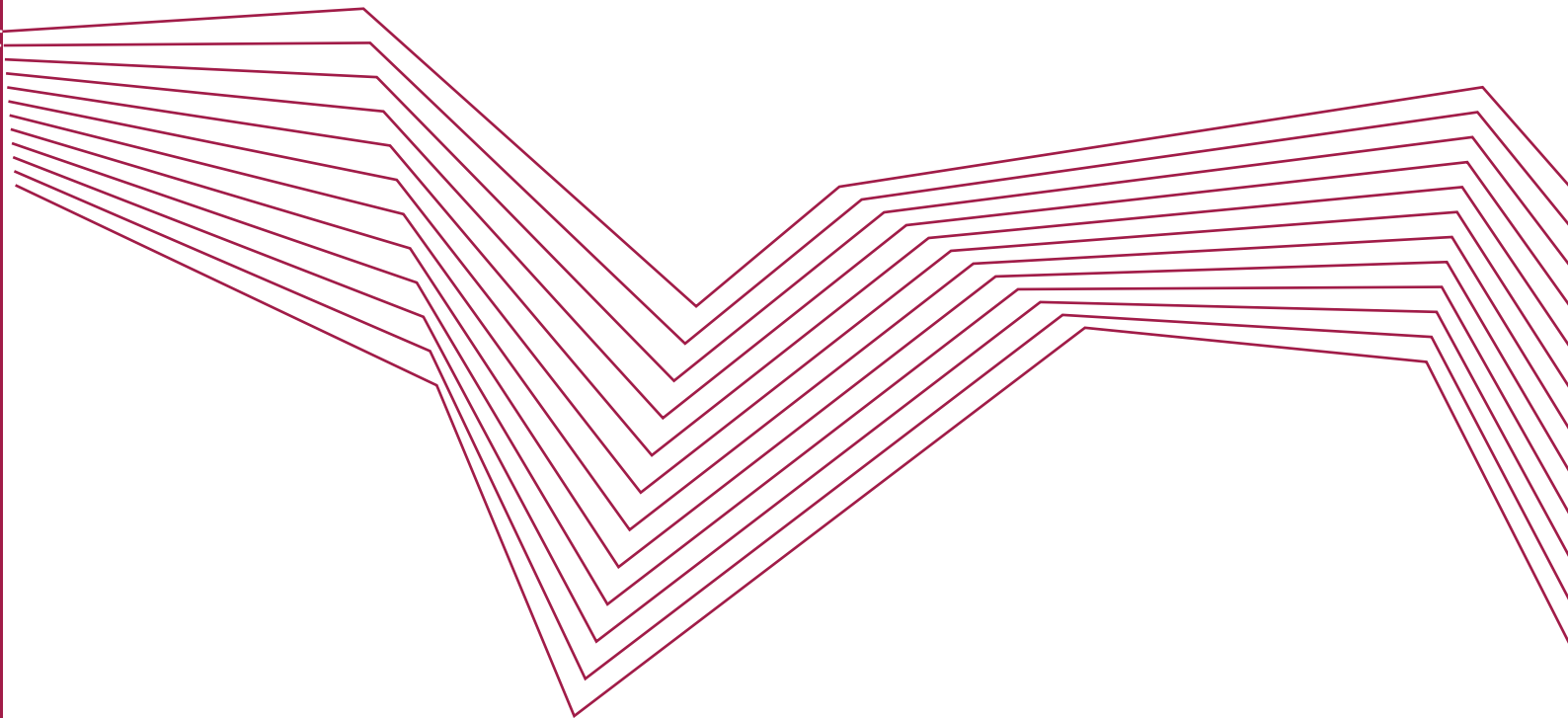
BANK OF PAPUA NEW GUINEA

# Implementation Roadmap





# 3. Implementation Roadmap



## 3.1. About the Implementation Roadmap

This roadmap sets out practical steps necessary to implement the Inclusive and Green Finance Policy (IGFP) – in particular the Inclusive and Green Taxonomy (which is one of the components of the Inclusive and Green Finance Policy) – in Papua New Guinea (PNG). The roadmap is less of a high-level narrative or vague aspirational strategy document but more a step-by-step practical to-do list and work plan with deliverables and timelines essential to operationalize the taxonomy. The current version of the roadmap, therefore, is intended only for the Bank of Papua New Guinea (BPNG), Centre for Excellence in Financial Inclusion (CEFI), and PNG’s financial institutions (FIs).

The specific objectives of this roadmap are to:

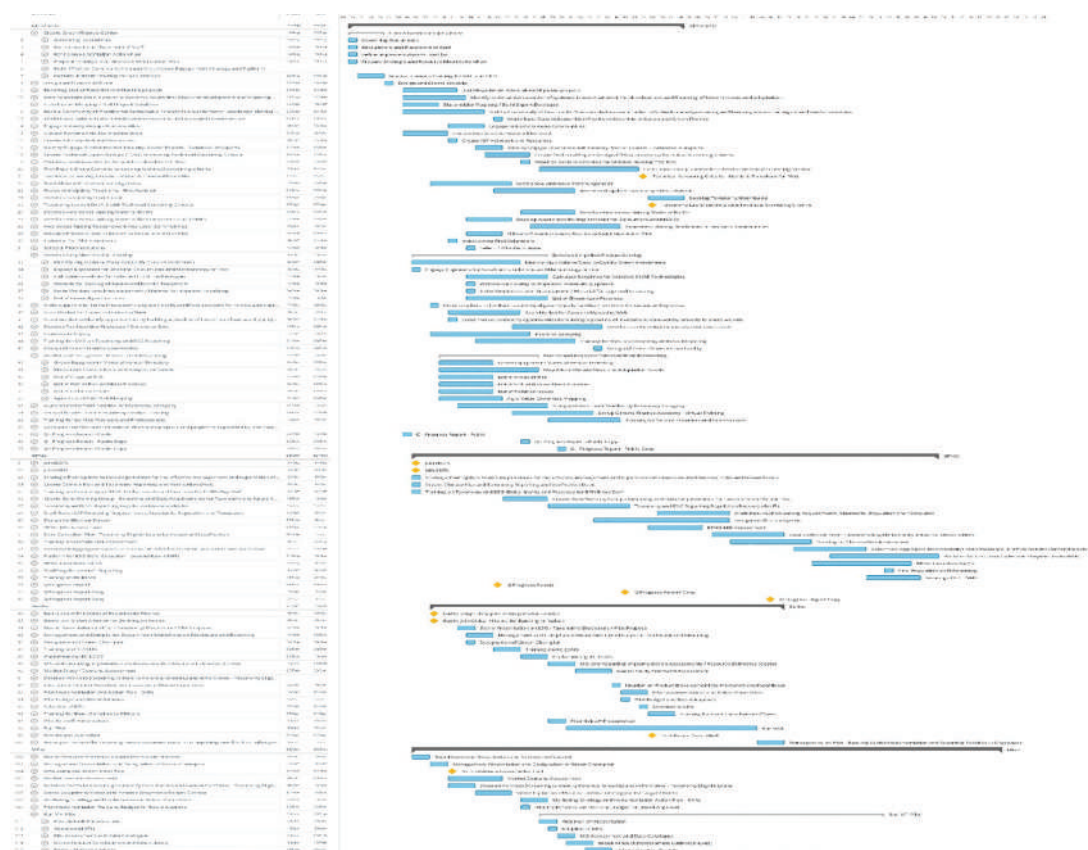
1. Integrate environmental and climate-resilient decision-making criteria into the financial sector
2. Provide broad guidance and good practices on low emission climate resilient development to financial system stakeholders
3. Help align and unify environmental and social policy actions across ministries, BPNG, and financial institutions
4. Strengthen the private sector ecosystem for inclusive and/or green finance
5. Ensure the stability of financial institutions and enable them to withstand the effects of climate change through effective climate risk management
6. Promote the development of inclusive and/or green financial products and services
7. Crowd-in private sector funding and mobilize predominantly private capital for sustainable investment
8. Introduce environmental, social, and governance (ESG) standards and risk management in FIs’ lending and disclosure practices

We expect the implementation of the taxonomy to be challenging and involve significant resources and time from both the BPNG and the FIs. The process will be supported by the Green Finance Centre as well as other technical assistance providers and experts. We estimate that the transition process will require at least 24 months. We anticipate that the implementation will be an iterative, actively managed process and that the roadmap and necessary tasks will be amended occasionally to reflect challenges, the evolving needs of the market and international best practices, institutional capacities, skill levels, data availability, technologies, and priorities of the government of PNG (GoPNG) and stakeholders.

Developing the taxonomy, although a time-intensive and collaborative endeavor, can be considered an output and the easy part of the overall effort. It is what one does with the taxonomy that matters and will impact the intended outcome. The taxonomy is only a classification system that ensures everyone is speaking the same language when it comes to describing an activity as inclusive or green. Hence, the taxonomy – if applied in a robust manner – facilitates the reporting of inclusive and/or green loans and investments by the financial sector and prevents greenwashing.

The transition process is intended to provide FIs with sufficient time to consider the impact of their loans and investments through the sustainability lens, and also to develop a strategy to gradually redirect their financial flows towards inclusive and/or green projects. Disclosing their green activities through key performance indicators to the public and investors, FIs will be held accountable for their direct and indirect impact on PNG's environment and global climate change. The taxonomy and ESG reporting will also allow individuals and companies to determine the impact of their economic activity and if those activities are affecting PNG natural capital and contributing to environmental goals and in line with PNG's strategies and policies.

The roadmap has been uploaded as a read only Project Gantt chart at the following link:  
<https://app.instantantt.com/shared/s/7ueSWolhHHI2hfcQ68TQ/latest>



The roadmap outlines a series of activities or tasks which are grouped by the organization which will be held accountable for delivering the planned activities or tasks.

There are four organizations which are the main actors or stakeholders in implementing the IGFP:

- Green Finance Centre
- Bank of Papua New Guinea
- Commercial Banks
- Microfinance Institutions

We discuss each of the participants in the sections below and list the task items for each stakeholder.

### 3.1.1. Green Finance Centre

The Green Finance Centre (GFC) will be a new institution created to, in effect, champion and coordinate all activities concerning inclusive and/or green finance initiatives, particularly the regular revisions to the taxonomy and facilitating its implementation. Its broad mission will be to lead the transformation of PNG's financial sector into one that is sustainable, resilient, and inclusive.

The GFC will be responsible for updating and executing the implementation roadmaps while also regularly reporting on the progress. The GFC will be tasked with periodic review, revisions, and updates to the taxonomy. The GFC will be core knowledge and data center for the green finance ecosystem, and it will serve as a forum for the public-private dialogues on green finance. It will be responsible for driving the awareness building about climate change and risks and the virtues and availability of green technologies. The GFC will, over time, maintain a help desk and website for FIs to answer any questions and will make final determinations of whether an activity is green or not, with the assistance of external technical experts if necessary.

Some of the activity items related to the GFC are:

- Create Green Finance Centre
  - ▶ Governing Documents
  - ▶ Recruitment and Placement of Staff
  - ▶ Refine Implementation Action Plan
  - ▶ Prepare Strategic and Resource Mobilization Plan
  - ▶ Build Effective Communication and Stakeholder Engagement Strategy and Platform
  - ▶ Internal in-depth Training for GFC and CEFI
  - ▶ Design and Create Website
- Build Register of Potential and Pipeline projects
- Identify and maintain a roster of systemic issues that block the development and financing of low emissions and adaptation...
- Stakeholder Mapping / Build Expert Database
- Build a Community of Practice for Sustainable Finance in order to foster knowledge-sharing and learning across the region and similar countries
- World Bank Data Indicator Identification relevant to Inclusion and Green Finance
- Engage Industry Groups/Communities
- Update roadmap via Stakeholder input
- Create IGF Helpdesk and Resources
- Identify/Engage Environmental, Industry, Sector Experts - Database of experts
- Create Technical Expert Groups (TEGs) to develop Technical Screening Criteria
- Prioritize sectors/activities for which to develop TSC first
- First Expert Group Convene to develop technical screening criteria
- Technical Screening Criteria - Metric & Threshold for PNG
- Road Show with Government Agencies

- Revise and Update taxonomy - First Revision
- Develop taxonomy User Guide
- Taxonomy Launch Draft 2 with Technical Screening Criteria
- Develop Awareness Raising Material for FIs
- Develop Awareness Raising Material for Consumers and MSME's
- Awareness Raising Roadshows in Key Local Communities
- FI Board Presentations to Boards to Solicit Interest in Pilot
- Invitation for Pilot Volunteers
- Select 2 Pilot Institutions
- Develop Simplified Product Catalog
- Identify High Volume/Easy to Qualify Green Investments
- Engage Engineers for Baseline Calculations and Methodology or Tool
- Calculate Baselines for Selected EE/RE Technologies
- Website for Catalog of Approved Material Equipment
- Invite Vendors to submit equipment / Material for approval to catalog
- List of Green Agro Practices
- Invite suppliers to list their taxonomy aligned (ideally certified) solutions for review and approval
- Scan Market for Cases to Upload to Web
- Scout market to Identify opportunities by building a pipeline of investment/loan-worthy projects to share with FIs
- Develop Tax Incentive Proposals / Options to Gov't
- Incentive Lobbying
- Training for SME on taxonomy and ESG Reporting
- Design of Green Finance Loan Facility
- Market and Eco system Research Understanding
- Green Equipment / Material Vendor Directory
- Map Client Climate Risks and Adaptation Needs
- List of Crops at Risk
- List of Fish at Risk and Best Practices
- List of Pollution Issues
- Agro Value Chain Risk Mapping
- Study on Investment Needed by taxonomy Category
- Set up Climate Finance Academy - Virtual Training
- Training for Service Providers and Professionals
- Collaboration Platform - Inform on all related projects and programs supported by international donors

### **3.1.2. Bank of PNG**

The BPNG, being the central bank and regulator of financial institutions, will play a key role in issuing regulations and reporting requirements for licensed FIs. BPNG will also regularly provide aggregated data to the public on green portfolios of the FIs and monitor and assess the risks and exposure to climate change of FIs in PNG.

To obtain capacity building assistance and access to knowledge and best practices which support the design and implementation of national sustainable finance initiatives within central banks, it is recommended that BPNG join and partner with two key international member organizations: Network for Greening the Financial System (NGFS), a group of central banks and supervisors defining and supporting best practices to be implemented, and Sustainable Banking and Finance Network (SBFN), a voluntary community of financial sector regulators, central banks, ministries of finance, ministries of environment, and industry associations from emerging markets committed to advancing sustainable finance for national development priorities, financial market deepening, and stability.

BPNG will need to determine what data FIs need to report, how often, what non-financial data FIs should disclose to the public in their annual reports, which disclosure standards to use (e.g., Task Force on Climate-Related Financial Disclosures) and the Environmental and Social Management Systems (ESMS) which need to be in place.

The disclosure by banks is broader than just the items listed in the taxonomy. The required disclosure by FIs broadly falls into the following categories:

- Environmental matters
- Social and employee aspects
- Respect for human rights
- Anti-corruption and bribery issues
- Diversity on board of directors

The taxonomy is a tool which will allow FIs to identify and report their environmental and social matters. The trend is that banks will be required to disclose what proportion of the assets in their banking book are aligned to a taxonomy. The Green Asset Ratio (GAR) is based on a green/sustainable taxonomy and is a Paris Agreement aligned ratio that can be used to identify whether banks are financing sustainable activities, such as those consistent with the Paris Agreement goals and PNGs climate adaptation or mitigation goals. The ratio will help policymakers better understand where the capital shortfalls are and feed into policy directives, which could see banks facing greater pressure from governments to lend to certain sectors. In theory, this GAR should provide investors and regulators with a single metric to determine how green a bank's balance sheet is, avoid greenwashing, and replace the patchy disclosure that many financial institutions use to claim their green finance credentials.

A draft Summary of the tasks and activities for the BPNG are:

- Join NGFS
- Join SBFN
- Strategic Plan Update to include principles for the effective management and supervision of climate-related financial risks and Green Assets
- Create Climate Risk and Taxonomy Reporting and Verification Dept.
- Training on Taxonomy and ESG Global trends and Practices for BPNG Key Staff
- Create Bank Working Group - Reporting and Data Requirements for Taxonomy and future ESG
- Taxonomy and ESG Reporting Regulation roadmap for FIs
- Draft Bank IGFP Reporting Requirements, Standards, Regulation and Templates
- Design Verification System
- BPNG MIS Assessment
- Data Collection Pilot - Taxonomy Eligible Loans by Industrial Classification
- Training on Climate Risk Assessment
- Determine Aggregate Data/Statistics to be Published in BPNG website (Green/Inclusive)
- Platform for ESG Data Collection - beyond Banks/MFIs
- BPNG Incentives for FIs
- Final Regulation on FI Reporting
- Training of IFC ESMS
- Q Progress Reports



### 3.1.3. Banks and MFIs

Banks and MFIs will be required to report their lending activities against the taxonomy. This is a complex task especially since companies in PNG are not required to report their ESG performance or on their environmental impact or green activities. Furthermore, we do not expect the technical screening criteria to be drafted and approved in the near term. Any technical classification of loans will require significant resources to train FI staff, introduce MIS changes, and changes in policies and compliance procedures. This effort will also require additional information to be collected from clients, their business activities, and specifics of the loans – the activities being financed.

We propose that in order to facilitate this implementation, banks and MFIs first create and pilot simple green loan products which will be used by clients to finance a small defined sub-set of the taxonomy – loans for PV and loans for selected/certified energy efficient equipment such as energy-efficient appliances or material such as thermal insulation. This list of eligible material or equipment will be prepared and technically verified by engineers supporting the GFC.

In the workplan section for banks and MFIs we list the major responsibilities, action steps, and tasks assigned to the FIs. These reflect the recommended simplified and incremental approach with a shallower learning curve. This will ensure that FIs can more effectively modify their systems, staff resources and skills, and thus successfully operationalize the taxonomy reporting requirements.

The task items for banks are the following:

- Banks adapt Principles of Responsible Finance
- Banks join Global Alliance for Banking on Values
- Board Presentation on ESG / Taxonomy/ Disclosure / Pilot Proposal
- Management and Compliance Department Workshops on Disclosure and Reporting
- Designation of Green Champion
- Training on IFC ESMS
- Implementing IFC ESMS
- MIS and Reporting Implementation Assessments / Resource Estimates (Costs)
- Market Study / Demand Assessment
- Detailed Portfolio Screening to Identify Potential Green Loans in Portfolios - Taxonomy Eligible Loans
- Ideation on Product Development (terms/conditions/incentives)
- Pilot Implementation and Action Plan - OKR's
- Pilot Budget and Board Approval
- Selection of KPIs
- Training for Bank Compliance Officers
- Pilot Kick-off Presentation
- Run Pilot
- First Report Submitted
- Retrospective on Pilot - Banking Sector Implementation and Reporting Feedback / Challenges

#### MFIs:

- Board Overview Presentation and Decision to Proceed
- Management Presentation and Designation of Green Champion
- MFIs complete Green Index Tool
- Market Demand Assessment
- Detailed Portfolio Screening to Identify Potential Green Loans in Portfolios - Taxonomy Eligible Loans
- Select Equipment/Material to Finance (Segments/Target Clients)
- Marketing Strategy and Implementation Action Plan - OKR's
- Pilot Implementation Plan and Budget for Board Approval
- Run MFI Pilot
  - ▶ Pilot Kick-off Presentation
  - ▶ Adoption of KPIs
  - ▶ MIS Assessment and Data Catalogue
  - ▶ Green Product Development (with incentives)
  - ▶ Policy / Process changes
  - ▶ Green Product Strategy and Marketing Plan and Budget for Board Approval
  - ▶ Eligibility Data from Clients - Revised Application Form
  - ▶ MIS Changes
  - ▶ Training for Pilot Staff
  - ▶ Pilot Green Product in 1-2 Branches
- Retrospective - Assessment of Barriers Challenges and Recommend Solutions
- Product, Sales Plan, Marketing Strategy, and Plan Review and Adjustments
- Final Product / Marketing and Sales Action Plan Rollout
- Training for Remaining Staff
- Full Green Product Launch
- First Report to GFC

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# Annexes

## Annex 1: Country background

Papua New Guinea (PNG) has a population of approximately 8,6 million people, most of them (more than 85%) live in rural areas. It is the largest economy in the Pacific. Nevertheless, PNG faces some unique challenges in comparison to the other Pacific nations. These include PNG's cultural and language diversity, but also the substantial geographical diversity. Those challenging geographical circumstances involve high infrastructure costs in rural areas and hence under-developed infrastructure in those regions. PNG has primarily two economies; a comparatively small formal sector (20%) and a large informal sector, mainly in rural areas. PNG is richly endowed with natural resources, but exploitation has been hampered by rugged terrain, land tenure issues, and the high cost of developing infrastructure. Mineral deposits, including copper, gold, and oil, account for nearly two-thirds of PNG's export earnings. The exploitation sites are scattered across the country and employ mainly male labour.

Between 1990 and 2018, Papua New Guinea's HDI value increased from 0.377 to 0.543, an increase of 43.9 percent but still the country is positioned at a very low development level, being ranked 156 out of 187 countries. Growing economic disparities between the rich and poor in PNG also cause increased social conflicts.

PNG ranks very low when it comes to gender equality in business but also in daily life. Petty trading in roadside and on town markets is dominated by women, although men control the more lucrative businesses such as village shops; the long-distance truck trade in high-demand commodities such as betel nut, second hand clothing, and manufactured goods. Nevertheless, women are expected to contribute a greater percentage of their income to support the househould than men, because women are responsible for the welfare of their family, while it is socially acceptable for men to spend their money primarily on themselves.

**Figure 1 : Map of Papua New Guinea**





## Annex 2: Agricultural sector

More than half of greenhouse gas (GHG) emissions come from the agriculture, forestry, and other land use sector (AFOLU). To protect people and assets from climate change and associated environmental shocks, it is estimated that the ASEAN region needs to increase ‘green investment’ by 400 percent a year, to about \$3 trillion total between 2016 – 2030 (Note: we have not come across any estimates for PNG). Currently, the vast majority of green capital flow comes from public and donor finance and only a small portion from private sources, yet the public-sector share is expected to drop in the ASEAN to about 40 percent by 2030, placing more urgency on raising private sector contributions. From now until 2050, globally, the investment in the sector will require 2 USD trillion provided, mostly by financial institutions, to reorganize global land-use in ways that meet growing demands for agricultural commodities while stopping tropical deforestation.

The agricultural sector is central to economic growth and poverty reduction. The sector has contributed between 25 to 40% GDP over the past 40 years and the 85% of the population are dependent on agriculture for their livelihoods. Despite this central role levels of productivity are relatively low by international and regional standards and the government is targeting improvements in agricultural productivity (by 60%) and expansion of area under cultivation (by 180%). Expansion plans for palm oil, coffee and cocoa are a key part of this and the government’s long-term strategy to develop a world-class agricultural sector that is responsive to international and domestic markets for a diverse range of products and provides the best available income and job opportunities by 2030. However, the government capacity and coordination to support the sector is limited with a lack of coordination between government departments, a lack of dialogue and transparency between the different actors engaged in agricultural commodities, low capacity in government departments to enforce existing legislation and an agriculture budget representing less than 2% of public spending<sup>2</sup>.

## 1. Department of Agriculture and Livestock (DAL)

The Department of Agriculture and Livestock (DAL) is the lead government agency responsible for the management of the agriculture sector in Papua New Guinea. Its mandate is to provide policy advice and technical and administrative support for optimal performance of the sector. These include - contributing strategic leadership and direction to the sector, - coordinating and monitoring national agricultural development programs, - providing advice that leads to an environment that facilitates investment and supports new initiatives, - facilitating and supporting effective partnerships between stakeholders, and - enhancing systems and delivery mechanisms for capacity building (extension, training, information). DAL is supported by ten (10) Commodities Boards and Agencies targeting each commodity indicated in the table below.

No	Agriculture Commodities	Commodity Boards & Agencies	Research and Regulatory Institutions
1	Oil Palm	Oil Palm Industry Corporation(OPIC)	
2	Coffee	Coffee Industry Corporation(CIC)	Coffee Research Institute(CRI)
3	Cocoa	Cocoa Board	Cocoa Research Institute
4	Copra	Kokonas Indastri Koperasen(KIK)	
5	Rubber	PNG Rubber Board	
6	Spice	PNG Spice Board	
7	Tea		
8	Livestock	Livestock Development Corporation(LDC)	
9	Fresh Produce	Fresh Produce Development Agency(FPDA)	
10			National Agriculture Research Institute(NARI)
11			National Agriculture Quarantine & Inspection Authority(NAQIA).

<sup>2</sup>Towards Sustainable Agriculture Commodities in PNG-Oil Palm, Coffee and Cocoa



## 2. Government Legislations & Policies

Some key policies, plans and legislations that support agriculture development in the country.

Polices and Strategies	Legislations
<ul style="list-style-type: none"> <li>National Food Security Policy 2017 – 2027</li> <li>National Rice Policy 2015-2030</li> <li>National Trade Policy 2017 – 2032</li> <li>National Agriculture Development Plan (NADP) 2007-2016</li> <li>NARI Strategy and Results Framework 2011- 2020</li> </ul>	<ul style="list-style-type: none"> <li>Bill) National Agriculture Administration Act 2014</li> <li>(Bill) Agriculture Investment Corporation Act 2014</li> <li>National Agriculture Research Institute Act 1997</li> <li>Animal Disease and Control Act 1952</li> <li>Animals Act 1952</li> </ul>

## 3. Climate Change Risks and Crop Diseases

Common diseases that affect commodities and climate change risks. Climate Change risks in PNG are similar to other Pacific island nations. PNG as a tropical nation has wet and dry seasons, and because of global warming farms are facing long dry spells and drought periods. Ground crops are affected more thus threatening self-sufficiency in food production. Since over 80% of the population rely on subsistence agriculture, droughts have the potential to cause catastrophic damage due to worsened food security and lessened availability of water (UNDP, 2019). Also, most of the PNG's land area is classified as high risk for coastal and riverine flooding, especially during strong El Niña event, and potentially damaging or life-threatening floods are expected to occur on 10-year intervals (GFDRR, 2019). Between 1990 and 2015, floods have affected almost half a million people across the country (CRED, 2019)<sup>3</sup>.

No	Commodities	Diseases	Climate Risks
1	Oil Palm	stem rot of the palm base	<ul style="list-style-type: none"> <li>Since over 80% of the population rely on subsistence agriculture, droughts have the potential to cause catastrophic damage due to worsened food security and lessened availability of water (UNDP, 2019).</li> <li>Most of the PNG's land area is classified as high risk for coastal and riverine flooding, especially during strong El Niña event, and potentially damaging or life-threatening floods are expected to occur on 10-year intervals</li> </ul>
2	Coffee	coffee berry borer (CBB), coffee leaf rust, coffee green scale	
3	Cocoa	Cocoa Pod Borer	
4	Copra	Bogia coconut syndrome	
5	Rubber		
6	Spice		
7	Tea		
8	Livestock		

<sup>3</sup>[https://www.preventionweb.net/files/68266\\_682309pngdrmsstatusreport.pdf](https://www.preventionweb.net/files/68266_682309pngdrmsstatusreport.pdf)



## 4. Agriculture Commodities & Agriculture Value Chain

Common deceases that affect commodities and climate change risks. Climate Change risks in PNG are Much has been said to encourage self-sufficiency in food production and processing in PNG but with minimal efforts on improving different aspect of agriculture value chains and appropriate import substitution approaches targeting the agriculture sector. Though in 2017, PNG government introduced a series of policies to promote domestic downstream processing in the fisheries and timber segments, and self-sufficiency in food production, these measures have been met with criticism from some sector players, who claim that not enough has been done to boost output and self-sufficiency may not work for every industry. While some value-added conversion is taking place, most commodities are exported in raw form, and the country's agriculture sector faces the challenge of converting cash crops to commercial farms.

**Oil Palm:** Oil palm is the third major crop with 14% of the annual export values. It covers land area of 58 000 hectares (estate 33 000 ha and smallholder 25 000 ha, involving about 7 000 families). The estates produce 65% of the output and 35% from the smallholders. The oil palm industry supports about 4.5% of all rural households and their annual production is at the rate of Department of Agriculture and Livestock (DAL) 12% since 1997. The overall growth rate of the industry since 1997 has been 15.5% per annum. All harvest from small oil palm block-holders are sold to NBPOL the major oil palm processor and manufacture in the country.

**Coffee:** Coffee is a major source of income for more than 50% of the PNG total population, 397,772 households, or more than 2.5 million growers. It is grown in 16 of PNG's 20 provinces and earns more than K525.8 million per annum of which 60-70% goes to coffee households (CIC 2021). Production in 2021 reached 724, 500 bags (43, 470 tonnes). Though this is an increased relative 2018 – 2020, it is still a drop after 2011 recording 1, 224,523 bags earning some K927 million. That was attributed by favorable weather conditions as well as a favorable world and domestic market prices that allowed good coffee plot rehabilitation and harvesting throughout 2010 – 2011 . Coffee value chain from the farm gate to the export markets has a lot of missing nuts and bolts causing disjoints including lack of training and technical support for farmers, access to credit, industry associations, standard, ne for specialty for every value chain participant etc.

**Cocoa and Coconut:** Cocoa and coconut make a significant contribution to household incomes and food security, while coconuts worth K160 million are consumed annually in domestic diets. The cocoa industry employs 31% of the national labor, while coconut provides direct and indirect employment to 36% of all rural households. Export revenue earnings from cocoa rank third after oil palm and coffee at K227 million per annum in the past five years, while those from coconut peaked at K275 million in 2008 (CCI 2009). In 2011, PNG cocoa earned K284 million kina (US\$134 million) (DAL 2013) while copra earned K245 million. Approximately 70% of PNG's cocoa is exported directly to the world's largest chocolate manufacturers. Over two million people, mostly from coastal provinces, cultivate cocoa . From Cocoa and Copra farmers to buyers and process and exporters the value chain efficiency is not to that of international standards and has lot of defects.

<sup>4</sup>CIC Website

<sup>5</sup>4th Qtr Report, 2020, KIK

<sup>6</sup>E-Agriculture Strategy 2016 – 2023



For instance, in the cocoa drying process more than 30,000 fermentaries of small holders use wood and thus the temperature and the smoke produce affects the final outcome. Lack of access to credit, transportation, trainings, specialization of VC players, etc. affects the final outcome. Same applies to copra VC.

**Fresh produce:** The ground crops or Fresh Produces are farmed by almost 80% of the active population with 4.3 million smallholders, or village farmers, who operate close to subsistence level. Population growth at an estimated 2.3% per year, combined with internal migration to urban and peri-urban areas, generate increased demand for food products, which is further intensified by a growing middle class and the expatriate community in the mining and gas industry. It is estimated that the total market demand for fresh produce is 1.32 million tons per annum, of which about 60% is covered by local production. Conversely, about 60 % of the modern market segments (supermarkets, catering companies, hotels, public institutions) are yet to be captured by PNG producers. While the ban placed on importing fruits and vegetables had been relaxed because of shortages and rising prices, the GoPNG announced that it was now reinstating it for fourteen fruits and vegetables.

The growing demand for fresh produce has also expanded the range of players along the value chain. However, largely informal and unstructured trading relationships result in high price variability, surpluses and shortages, as well as high wastage levels. Poor buyer-seller relationships are compounded by the lack of postharvest handling systems, limited postharvest infrastructure, lack of cool chain management, lack of specialized transport equipment, and frequent delays in transportation to market, due to damaged roads and changing shipping and airfreight schedules. The lack of access to finance eventually affects farmers' incentive to sell, as buyers are unable to pay them on delivery. High logistical costs due to the poor transport network, and the lack of market organisation and of market information further discourage small farmers from raising production for the market – it is estimated that only 4% of the country's land is used for commercially-oriented agriculture production. The value chain is fragmented and makes it more difficult for both support business and farmers to expand and increase productions. Finally, while high rainfall, long dry seasons and excessive cloud cover are common constraints to agricultural development, they are further aggravated by increasing climate-change related hazards<sup>7</sup>.

**Livestock:** Currently PNG produces around 1,400 to 2,000 tons of meat annually; and all are consumed domestically. However, in order to meet the local demand, the country imports around 14,000 tonnes of meat annually at a cost of K30 million; of which around 70% of imported beef is used by two commercial canneries to produce coned beef, luncheon meat and meat loaf products. In all, the livestock sub-sector contributes about 15% of the total domestic food production and about 12% of the gross domestic product. The current target, as established under the PNG Development Strategic Plan 2010-20130, is to increase domestic production to four million metric tonnes by 2030. Current production is 400,000 tonnes which is only 10% of the meat target set by the PNGDSP.

<sup>7</sup>MFV Technical Proposal

**Rubber:** Rubber is the oldest, yet it is still a major crop compared to other tree crops, and presently has 60,000 farmers growing it. The industry had seen a decline in production over the past 20 years, however with the revitalization and establishment of an efficient board in 2015, the industry is slowly making a comeback. Rubber is also known as a secondary forest with a big future and longtime investment. Currently, there are two Technically Specific Rubber (TSR 10) factories in the country. Privately owned, one is in the Western Province and the other at Doa in the Central Province. They export some 300,000 – 400,000 tonnes every month. The Rubber Board is looking at increasing that number of growers to 100,000 and the volume to 600 or 800 thousand tonnes by the end of 2018. There are eight provinces presently growing rubber in PNG, namely, Central, Gulf, New Ireland, Manus, Oro, Western, East Sepik and Sandaun.

**Spice:** Spice is a new and upcoming industry in Papua New Guinea. The industry supports up to 100,000 households and has an estimated industry value of K100 million. Price fluctuations at the world market determine the value of the industry in terms of spice product exports to countries like USA, New Zealand and others in Europe. The industry however has been progressing at a low rate than anticipated. Vanilla is particular has shown some great potentials, with a boom between 2000 to 2003, when farmers were earning substantial income from the sale of high-grade beans in the domestic market.

## 5. Buyers, Processors and Exporters

There is minimal to nil downstream processing of agricultural commodities in the country. Tree crop commodities are exported to the international markets to buyers who then manufacture final goods. The fresh produce industry has nil processing and most fresh produce is consumed domestically

No	Commodities	No. of Processors & Buyers	No of Processors, Buyers & Exporters
1	Oil Palm		1
2	Coffee	Small Holders	17
3	Cocoa	Small Holders	7
4	Copra	5	25(75% of export is by only two exporters)
5	Rubber		3
6	Spice		4
7	Tea		1
8	Livestock	3	Nil
9	Fresh Produce	Fresh produce buyers	Nil



## 6. Sustainable Agriculture Commodities

Under the UNDP Green Commodity Program, a study was conducted in PNG to assess the business case for enacting a set of policies and measures to reduce the future impact of key agricultural commodities on forest cover in Papua New Guinea, while allowing for ongoing growth within these sectors.

It finds that while PNG has ambitious plans to increase agriculture production through a combination of increased productivity (by 60%) and increase land under cultivation (by 180%) the balance of these approaches varies by commodity. Developments within the cocoa and coffee sectors are focused on improvements in productivity while the palm oil sector is focused on increasing production through expansion of the area under cultivation and represents the most significant threat to levels of forest cover. Indeed, the area under cultivation estimated at 150,000 ha is already set to more than double in the short term based on expansion of existing projects and increase by 10-fold to 1.5 million ha by 2030 according to government plans .

This expansion is not in line with the same internationally recognized sustainability standards currently applied by palm oil producers within the country. and presents a potential reputational risk to the entire PNG palm oil sector. The global industry is under significant public scrutiny and is moving increasingly towards internationally recognized standards as a norm. Indeed, companies responsible for 90% of global palm oil trade have committed to zero net deforestation within their supply chains by 2020. The Netherlands, UK and Germany, the largest purchasers of palm oil products from PNG have also recently signed the Amsterdam Declaration to ensure that by 2020, 100% of palm oil entering their countries is from sustainable sources. To reduce the risk to forests, ensure the profitability of the sector and its long-term sustainability it is recommended that PNG position itself as a global leader for sustainable palm oil production. This is fully aligned with government long-term strategy expressed in STaRS and its associated Green Growth Framework and could provide strong benefits for PNG's people, economy and the environment.

## 7. Fisheries

The average market value of PNG catch is estimated at K350 to K400 million a year however there is huge potential for increased economic value and returns to the national coffers with improved management and development programs (NFA 2016). Although earnings from exports of fisheries resources are important, the subsistence economy also means a lot the people and domestic economy due to daily reliance. The major revenue of the fisheries sector comes from access fees from deep-water fishing. In line with the Fisheries Management Act, NFA also generates income from license fees from other operators, assistance from donors and penalties arising from prosecutions. In April 2016, NFA made a K25 million dividend payment to the government, which came in less than a year after the authority also announced a K50 million dividend in October 14, 2015 (NFA Website 2016). Rubber (K41 million) and tea (K14 million) are other export commodities (DAL 2013).

Under artisan fishermen/women and fishing SMEs NFA made a credit facility available through Mibank for sector funding. The facility has been operating since 2015. Over the span of 6 years Mibank has lent an estimate amount of over K30 million worth of loans through the NFA credit facility.

<sup>8</sup>*Towards Sustainable Agriculture Commodities in PNG-Oil Palm, Coffee and Cocoa*

## Annex 3: Financial sector

The financial Sector of PNG is relatively small consisting of three regulators and the financial institutions including Central Bank of PNG overseeing the Banking, non-bank financial intuitions, finance companies and Life Insurance Operators. Insurance Commission regulating the Motor Vehicle and General Insurance sector and Exchange Commission regulates Securities Markets. The Payment system in PNG has improved with recent improvements including enactment of the National Payments System Act 2013, and the establishment of a payments oversight unit within BPNG, installation of the Kina Automated Transfer System (KATS) .

In 1999, only about 5% of the population had access to financial services of any kind, while in 2020 the part of the population having access to formal financial services had significantly increased. However, approximately 80% of PNG's population still remains 'unbanked'. Nevertheless, the country has a fairly well-developed financial sector in terms of the type (banks, microfinance institutions and savings and loan societies) and number of institutions operating, years in operation and sophistication of regulated financial institutions compared to others in the region.

Following the banking crisis at the turn of the millennium, the number of seven banks decreased to five as of today. The 4 commercial banks are the major player in PNG's financial system, accounting for 92 percent of bank and credit institutions' total assets. Of these banks, two (BSP and Kina Bank) are PNG owned and two (ANZ and Westpac) are subsidiaries of Australian-based banks. The Government owned National Development Bank (NDB) is established by a separate Act and does not fall under the supervision of Central Bank of PNG. The bank was initially established as the Rural Development Bank in 1969 and change to NDB. The primary purpose of this bank is to fund rural and agriculture businesses targeting agriculture tree crop/commodities.

**Table 4:** List of PNG licensed commercial banks

No	Name of the bank	Market share (OLP, 2018)
1	Bank of South Pacific Limited (BSP)	55,4%
2	Australia & New Zealand Banking Group (PNG) Limited (ANZ)	26,6%
3	Westpac Bank (PNG) Limited	14,3%
4	Kina Bank Limited	3,7%
5	National Development Bank	n.a.

*Italics: Public, not commercial bank. Source: BPNG*

Among the commercial banks, BSP is the clear leader and the dominant player. According to the bank, it has 55.4% of total loans outstanding in the market, against ANZ's 26.6%, Westpac's 14.3% and Kina Bank's 3.7%. BSP has 44 branches in PNG, as well as 45 sub-branches, 307 ATMs and 178 agents. That compares with Westpac's 16 branches, ANZ's 16 and Kina Bank's four. Nationwide Microbank (MiBank) has 12 branches (figures as of 2018).

Although banks still dominate the 12 non-bank licensed financial institutions, and 16 saving & loan societies play a growing role in delivering financial services to individuals.

**Table 5: List of PNG licensed Non-Bank Financial Institutions**

No	Name of the non-bank financial institution
1.	BSP Finance (PNG) Limited
2.	Credit Corporation Finance Limited
3.	Finance Corporation Limited
4.	First Investment Finance Limited
5.	Heduru Moni (Moni Plus) Limited
6.	Kada Poroman Microfinance Limited
7.	Nationwide Microbank Limited
8.	Papua Finance Limited
9.	People's Micro Bank Limited
10.	PNG Microfinance Limited
11.	Resource & Investment Finance Limited
12.	Women's Micro Bank Limited

\* Source: BPNG

Under the current reforms of the Savings and Loan Societies Act 2015, 16 saving and loan societies fulfilled the requirements in order to be licensed by BPNG.

**Table 6: List of PNG Savings & Loan Societies**

No	Name of the savings and loans society
1.	Alekano Savings & Loan Society Limited
2.	Air Niugini Savings & Loan Society Limited
3.	CBO Savings & Loan Society Limited
4.	East New Britain Savings & Loan Society Limited
5.	Financial & Private Sector Savings & Loan Society Limited
6.	Manus Savings & Loan Society Limited
7.	Nasfund Contributors Savings & Loan Society Limited
8.	Niu Ailan Savings & Loan Society Limited
9.	Mining & Petroleum Savings & Loan Society Limited
10.	Nambawan Savings & Loan Society Limited
11.	PNG Power Savings & Loan Society Limited
12.	PNG Ports Corporation Savings & Loan Society Limited
13.	PNG Waterboard Staff Savings & Loan Society Limited
14.	Post Telecommunication & Pangtel Savings & Loan Society Limited
15.	Rural Development Bank Savings & Loan Society Limited
16.	Teachers Savings & Loan Society Limited

\* Source: BPNG

Based on Central Bank reforms in 2000 and 2015 the number of Loans and Savings Societies dropped to 16. The current legislation completely overhauls the segment, with an entirely new regime for licensing created. Minimum capital requirements have been established, and the method of supervising savings and loans has changed, bringing oversight more in line with that for larger, more mainstream financial institutions. Directives are being replaced with prudential standards. The segment will also be made more open and competitive, and any person in the country will be able to apply for an account at any savings and loans society.



In table below please find attached key balance figures of PNG financial sector:

**Table 7: Balance figures of PNG financial sector**

*in million US*

Item	Commercial Banks 30/03/2020	Financial Institutions	Savings and loan Societies 30/03/2020
<b>Assets:</b>			
Foreign assets	400		
Currency		5	3
Currency and deposits with BPNG	1087		
Deposits with commercial banks		24	34
Governmental and BPNG securities	2573		167
Loans to government:	55		
Loans to public sector:	677		
Loans to private sector:	3117	245	130
Other assets:	725	23	63
<b>Total assets</b>	<b>8634</b>	<b>297</b>	<b>397</b>
<b>Liabilities:</b>			
Local deposits:	5353	155	222
Foreign liabilities	303		0.1
Liabilities to Central Government	590		
Loans	2		0.6
Other liabilities	629	40	2
<b>Total liabilities</b>	<b>6877</b>	<b>195</b>	<b>225</b>
<b>Capital:</b>			
<b>Total capital</b>	<b>1757</b>	<b>102</b>	<b>172</b>

*\* Source: BPNG*

Banks, microfinance and savings & loans organisations provide typical banking services like acceptance of deposits, issuance of the loans, remittances, etc. Digital finance services are provided as well: There are two mobile money service models in PNG: the bank-led model (e.g., goMoney by ANZ; MiCash by MiBank) and the non-bank-led model like Cellmoni offered by Digicel. Mobile phone banking appears to have particular innovative advantages in capturing this market due to its convenience, relative low costs and privacy. The latter issue of privacy is particularly important for women trying to preserve their savings.



## Agriculture Lending Portfolio

Ninety percent (90%) of the combine lending portfolio of the banks and financial institution are on assets financing including building (commercial and residential), plant and equipment (heavy machinery), motor vehicle, trade financing and others. Nil to minimal funding is made available towards agriculture lending. This funding is targeted towards established industries such as coffee, cocoa and copra. Along the agriculture value chain, it is clear that minimal funding is made to the agriculture sector by banks and financial institutions but its actual portfolio is unclear. This lending is based on non-agricultural cash flows or a combination of both. NDB lends to the key agriculture commodities businesses and does not lend to small holders or farmers including fresh produce farmers.

A key rationale why banks not targeting this market for direct agriculture funding is that banks and lending institutions consider it as high-risk zone to invest in. This may be because of various factors. At the macro level this includes lack of infrastructure (roads, bridge, institutional arrangements, technology, government policy), disconnects between the markets and the agribusinesses and farmers, limited and inconsistent supply to the market, law and order issues. At the farming level, lending is made even difficult with major challenges. On a credit assessment study conducted by AFC under Market for Village Farmers Project (MVF) indicate that 100% of the farmers interviewed lack acceptable non-cash collaterals, their cash flow is based on seasonality, conventional monthly loan repayments not feasible, farmers are not financially literate, etc... However, 100% of the farmers and agriculture business owners interviewed also indicated that they need credit. From the farm gates to dining tables across PNG participants in the agriculture and its value chain need access to funding. Farmers need credit for farm expansion, improvement, and increase production. Despite this a handful of farmers and businesses operating in Agriculture and its value chain do access funding from the banks given that they meet the standard credit worthiness requirements applied to any other businesses by the banks and lending institutions. Though there were some credit schemes or industry-based savings and loans society to lend to the farmers most of them fail and are currently non-existent.

Despite the advanced financial sector development, significant part of PNG's population remains financially excluded, especially farmers. Situation is better with suppliers/ wholesale buyers of agriculture production as most of these are under small business category and being funded by banks as businesses. The challenge now is how to bridge the credit gap between the Agriculture and Agriculture Value Chain participants and the lending institutions in the country and to achieve sustainable agriculture without threatening the environment.

## Annex 4: Interviewees

#	Date	Organisation	Name of person interviewed	Designation
1	3/14/2022	National Weather Service	Ms. Kisolet Posanau	Senior Climate Officer
2	3/15/2022	Kina Bank	Ms. Karen Mathers & Ms. Samantha Miller	KM: Chief Risk Officer & SM: Executive General Manager, Investor Relations and
3	3/18/2022	Bank of South Pacific	Mr. Dennis Lamus	Cooperate Affairs
4	3/21/2022	Nationwide MicroBank (MiBank)	Mr. Tony Westaway & Ms. Pelina Daniels	Area Manager NCDIRetail Bank
5	3/22/2022	Solar Energy Association of PNG	Mr. Christian Lohberger & Mr. Manu Rawali	TW: Chief Executive Officer & PD: Credit Analyst
6	3/25/2022	National Energy Authority	Mrs. Rebecca Kiage	CL: President & MR: Board Member Interim Executive Manager, Policy Division
7	3/25/2022	SME Corporation	Mr. Danny Koka & Mr. Peter Pena	DK: Coordinator SME Credit Scheme Access PP: Cordinator, SME Business Ideas and Incubation
8	3/23/2022	Brian Bell Trade & Electrical	Mr. Brett Cox & Mr. Srinivas Ramamoorthy	BC: Branch Manager, Brian Bell Trade & Electrical, Port Moresby SR: Group Buyer, Trade Electrical & Chemicals
9	4/5/2022	PNG Power Ltd	Mr. Francis Uratun	Senior Manager Network and Renewable Energy Planning, Strategic Business Development and Government Relations
10	4/19/2022	Climate Change & Development Authority	Mr. Danny Niketal	Manager Mitigation and Low Carbon Growth, REDD+ & Mitigation Division
12	4/20/2022	UNDP	Ms. Gretel Orake	Policy Manager
13	4/26/2022	Papua New Guinea Forest Authority	Mr. Alois Jenkihau	Manager, Policy and Aid Coordination Branch, Resource Planning & Development Directorate
14	4/29/2022	Tourism Promotion Authority	Ms. Ingrid Kuman	Director, Policy
15	5/3/2022	International Finance Corporation	Mr. Aaron Levine	Financial Sector Specialist

