



**Verified Carbon
Standard**

PNG COMMUNITIES BEST REDD - TAVOLO PROJECT



Document Prepared by FORCERT, Kimbe, Papua New Guinea,
with technical assistance from Face the Future, Wageningen, The Netherlands

Project Title	PNG Communities BEST REDD - Tavolo Project
Version	1.1 DRAFT
Date of Issue	08 May 2021
Prepared By	FORCERT
Contact	P.O.Box 772 Kimbe, West New Britain Province, Papua New Guinea; +67573006023; cmakamet.FORCERT@gmail.com

CONTENTS

CONTENTS	2
1 PROJECT DETAILS	4
1.1 Summary Description of the Project	4
1.2 Sectoral Scope and Project Type	6
1.3 Project Eligibility	6
1.4 Project Design	6
1.5 Project Proponent	6
1.6 Other Entities Involved in the Project	7
1.7 Ownership	7
1.8 Project Start Date	8
1.9 Project Crediting Period	8
1.10 Project Scale and Estimated GHG Emission Reductions or Removals	8
1.11 Description of the Project Activity	10
1.12 Project Location	14
1.13 Conditions Prior to Project Initiation	14
1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks	18
1.15 Participation under Other GHG Programs	22
1.16 Other Forms of Credit	23
1.17 Additional Information Relevant to the Project	23
2 SAFEGUARDS	23
2.1 No Net Harm	23
2.2 Local Stakeholder Consultation	23
2.3 Environmental Impact	23
2.4 Public Comments	24
2.5 AFOLU-Specific Safeguards	24
3 APPLICATION OF METHODOLOGY	24
3.1 Title and Reference of Methodology	24
3.2 Applicability of Methodology	25
3.3 Project Boundary	25

3.4	Baseline Scenario	32
3.5	Additionality.....	39
3.6	Methodology Deviations	43
4	QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS.....	43
4.1	Baseline Emissions.....	43
4.2	Project Emissions.....	55
4.3	Leakage	59
4.4	Net GHG Emission Reductions and Removals	59
5	MONITORING.....	61
5.1	Data and Parameters Available at Validation.....	61
5.2	Data and Parameters Monitored	74
5.3	Monitoring Plan	80
	LITERATURE	83
	APPENDIX 1 - MOU BETWEEN CCDA AND FORCERT LTD	85
	APPENDIX 2 – DDLL MUKUS-MELKOI PROJECT PROPOSAL	93
	APPENDIX 3 – KAKUNA-LOTE AGRO FORESTRY & REFORESTATION PLANTATION DEVELOPMENT PROJECT (FCA PROJECT PROPOSAL)	93
	APPENDIX 4 – KAKUNA-LOTE AGRO FORESTRY & REFORESTATION PLANTATION DEVELOPMENT PROJECT (FCA PROJECT MAP).....	94
	APPENDIX 5 – STANDARD OPERATING PROCEDURE FOREST INVENTORY TAVOLO .	94

1 PROJECT DETAILS

1.1 Summary Description of the Project

The Tavolo Community is located in East New Britain Province, on the South Coast of the island of New Britain, Papua New Guinea (PNG). The clans of the Tavolo Community hold customary land rights to a total area of 21,782 ha (hereafter referred to as the 'Tavolo Project Area'). This area has been under consistent threat from large scale logging and conversion to oil palm plantations.

In order to protect their forests and forest resources, whilst still obtain a revenue source, the community first approached FORCERT in 2007 to enquire into the possibility of carrying out community based small scale logging operations under the FSC Group Certification Service Network that FORCERT then managed. To become a member of this Service Network, the community organized itself first into the Tavolo Business Group, with the idea of using their FSC certified portable sawmilling operation to generate income and employment for the community, allowing them to protect their forest. When it became clear that these benefits alone would not be sufficient to guarantee this protection, the community started work with FORCERT to trial Payments for Environmental Services as additional income generation under the PNG Communities Benefits from Environmental Services Trust (PNG Communities BEST). The community then decided to organize themselves under the Tavolo Community Conservation Association (hereafter referred to as the 'Tavolo Community') and committed itself to sustainably manage their land, carrying out FSC certified small scale reduced impact logging on a dedicated part of their forest, while the remainder of their forest is put under conservation. Also the community has put the combined land area of all clans that make up the community under a sustainable land use plan, aimed at zoning of other land uses and avoiding their encroachment on forest land, and for some areas even relocating agricultural land converted in the past back to forest.

Currently the remaining natural forest in the Tavolo Project Area is under threat of being deforested by a Land Owner Company (LOC) called Kakuna-Lote Resource Development Ltd (Kakuna-Lote LOC) in cooperation with the contractor and investor Mekar (PNG) Ltd.¹ In 2019 Kakuna-Lote LOC gained access to the community land and the forest resources in the Tavolo Project Area through a Special Agriculture Business Lease (SABL) called the Mukus-Melkoi SABL. With this Mukus-Melkoi SABL, which is granted over a total area of 68,300 ha, Kakuna-Lote LOC and Mekar Ltd are now planning a large scale forest conversion to agriculture and other land use under the name of Kakuna-Lote Agro Forestry & Reforestation Plantation

¹ Mekar PNG Ltd is a subsidiary of Vanimo Jaya Ltd (see ENB FM Committee minutes of a meeting in November 2019 handling the Kakuna-Lote FCA application)

Development Project (hereafter referred to as the 'Kakuna-Lote Project'). In order to establish the Kakuna-Lote Project, the Kakuna-Lote LOC has requested for a Forest Clearing Authority (FCA) from the Papua New Guinea Forest Authority (PNGFA) in 2019 to clear fell 45,980 ha of forest in the Mukus-Melkoi SABL area, starting in 2019/2020.¹After clear-felling, Kakuna-Lote LOC plans to convert 32% (16,800 ha) of the deforested area into a Eucalyptus plantation, and another 4% (1,800 ha) of the area into Cocoa/Coffee plantation.²

The Kakuna-Lote project however is planned by the Kakuna-Lote LOC and Mekar Ltd. without the free, prior and informed consent of the local communities who hold customary land rights over the area zoned under the Mukus-Melkoi SABL.

The aim of this PNG Communities BEST REDD – Tavolo Project (hereafter referred to as the 'Tavolo REDD Project') is to assist the Tavolo Community to conserve and protect the natural rainforest in the Tavolo Project Area from being cleared and converted under the Mukus-Melkoi SABL as part of the Kakuna-Lote Agro Forestry & Reforestation Plantation Development Project. In order to protect the forest from the planned deforestation the Tavolo REDD Project implements the following activities in the Tavolo Project Area:

1. A Court's or official Government administrative decision will be obtained to declare the Mukus-Melkoi SABL and any accompanying or underlying logging permits and project plans null and void;
2. The communities within the Tavolo Project Area who organized themselves into the Tavolo Community Conservation Association will develop and implement Community Conservation Laws, in which rules are set by the communities regarding the land use and the conservation of the forest in the project area. A system will be set up by the communities to enforce and monitor compliance with the rules set out in the Community Conservation Laws;
3. The communities will manage and conserve their forests under a sustainable land use plan which is designed by the communities in cooperation with FORCERT. These land use plans will focus on forest conservation, small scale eco-forestry and sustainable small scale agriculture;
4. The communities will participate in the PNG Communities Benefits from Environmental Services Trust (BEST). Through this Payment for Ecosystem Services (PES) fund the communities will receive financial benefits from preserving the forest in the project area, additional to the direct ecosystem service benefits their forest provides, and this will enable the communities to carry out the activities necessary for the sustainable use of their land and natural resources, also in the future. Resources for the PNG Communities BEST will be attracted by obtaining FSC certification, Fairtrade certification and VCS & CCB validation and verification, carbon credit issuance, and finally selling these carbon credits on the voluntary market;

¹Kakuna-Lote FCA Project proposal, June 2019, section 4.2.4 and attached map with Kakuna-Lote harvesting plan

²Kakuna-Lote FCA Project proposal, June 2019, section 4.4

5. A formal protection status will be obtained for the forests under the grouped REDD project. Such a formal protection status could for example be a Wildlife Management Area (WMA) or a Conservation Deed.

Through the above mentioned project activities the forests under the TavoloREDD Project will be protected from clearance, and net GHG emission reductions or removals will be achieved. The lifetime of the project activities will be 30 years, starting from the Project Start Date of 23 January 2019. The estimated annual GHG emission reductions or removals for the first project instances is estimated at 6,028,743 tCO₂e over the project crediting period of 30 years.

1.2 Sectoral Scope and Project Type

VCS Sectoral scope: Scope 14 - Agriculture Forestry and Other Land Use (AFOLU)

AFOLU project category: Reduced Emissions from Deforestation and Degradation (REDD).

REDD activity type: Avoiding Planned Deforestation and/or Degradation (APDD).

Grouped project: No

1.3 Project Eligibility

The project qualifies as an Avoided Planned Deforestation/Degradation project (VCS category APD) because:

- The conversion of forest lands to a deforested condition in the Tavolo Project Area is legally permitted under the Mukus-Melkoi SABL;
- Project documentation is available to clearly demonstrate that the land in the project area would have been converted to non-forest use if not for the REDD project.

1.4 Project Design

The Tavolo REDD Project has been designed to include a single installation of an activity, focusing on the avoidance of the planned deforestation in the Tavolo Project Area.

1.4.1 Eligibility Criteria New Project Activity Instances

This is not a grouped project.

1.5 Project Proponent

Organization name	FORCERT
Contact person	Cosmas Makamet
Title	Manager

Address	P.O.Box 772 Kimbe, West New Britain Province, Papua New Guinea
Telephone	+67573006023
Email	cmakamet@forcertpng.org

1.6 Other Entities Involved in the Project

Organization name	Tavolo Community Conservation Association
Role in the project	project beneficiary
Contact person	Peter Kikele
Title	Chairman
Address	P.O.Box 1789 Kokopo, East New Britain Province, Papua New Guinea
Telephone	+67579138891
Email	-

Organization name	Face the Future
Role in the project	Technical assistance in VCS&CCB project development
Contact person	Wouter van Goor / Kars Riemer
Title	Consultant – Project development
Address	Hollandseweg 7H, 6706 KN Wageningen, The Netherlands
Telephone	+31 30 31 010 44
Email	w.vangoor@facethefuture.com / k.riemer@facethefuture.com

1.7 Ownership

Land ownership across PNG, and therefore also in the Tavolo Project Area, is organized at the clan level. There is no traditional individual ownership. Customary ownership of land in PNG is recognized in the Constitution of the Independent State of Papua New Guinea (1975) under the Division 3 Basic Rights in Section 53 (Protection from unjust deprivation of property) subject to Section 54 (Special provision in relation to certain lands). This also includes full ownership of all natural and forest resources on the land. Customary landownership can be claimed and proven through oral history and traditional knowledge of the land and its specific features. There is no need for written land titles or other paper documented proof of traditional landownership in

PNG. Correlating to Section 54 (Special provision in relation to certain lands) is the Land Act 1996 Section 132. Disposal of Customary Land that says a customary landowner has no power to sell, lease or otherwise dispose of customary land or customary rights otherwise than to citizens in accordance with custom, and a contract or agreement made by him to do so is void.

As specified by Subsection (2) of Section 11 of the Lands Act 1996 that; Where the Minister leases customary land under Subsection (1), an instrument of lease in the approved form, executed by or on behalf of customary landowners, is conclusive evidence that the State has a good title to the lease and that all customary rights in the land, except those which are specifically reserved in the lease, are suspended for the period of the lease to the State. This safeguards the rights of the State and the sub lessee under a so called Special Agricultural Business Lease (SABL).

1.8 Project Start Date

Project start date of the Tavolo REDD Project is **23 January 2019**. This is the signing date of the Cooperation Agreement between FORCERT, Face the Future and Greenchoice (the project pre-financer). With this agreement the three parties have agreed to aid the Tavolo Community in a court case aiming to nullify the Mukus-Melkoi SABL and the Lote-Kakuna Project, and to develop a Payment for Ecosystem Service (PES) fund for the communities in the Tavolo Project Area, in order for them to benefit from preserving the forest, also in the future.

1.9 Project Crediting Period

Project Crediting Period will be **30 years**.

The projection of baseline emissions is presented in this Project Document (PD) for the first 10-year period after the project start date. After every 10 years the baseline will be reassessed and revised. Emission reductions/removals will be claimed for the 10-year periods for which the baseline is fixed and a monitoring plan has been implemented.

1.10 Project Scale and Estimated GHG Emission Reductions or Removals

Projects are categorized by size according to their estimated average annual GHG emission reductions or removals, as set by the VCS Standard v.4.0 (section 3.9.1):

- 1) Projects: Less than or equal to 300,000 tonnes of CO₂e per year.
- 2) Large projects: Greater than 300,000 tonnes of CO₂e per year.

Looking at the estimated annual GHG emission reductions for the project crediting period, the project scale is categorized as a **'Project'**:

Project Scale	
Project	x

Large project

The estimated annual GHG emission reductions or removals for the project crediting period is presented in the following table:

Year	Estimated GHG emission reductions or removals (tCO ₂ e)
Year 1	1,542,571
Year 2	1,682,401
Year 3	1,372,328
Year 4	228,040
Year 5	169,593
Year 6	169,593
Year 7	169,593
Year 8	169,593
Year 9	169,593
Year 10	169,593
Year 11	113,197
Year 12	53,824
Year 13	8,035
Year 14	5,814
Year 15	5,814
Year 16	5,814
Year 17	5,814
Year 18	5,814
Year 19	5,814
Year 20	5,814
Year 21	3,812
Year 22	1,704
Year 23	79

Year 24	-
Year 25	-
Year 26	-
Year 27	-
Year 28	-
Year 29	-
Year 30	-
Total estimated ERs	6,064,253
Total number of crediting years	30
Average annual ERs	202,142

1.11 Description of the Project Activity

Three communities in the Tavolo Project Area, Mukus, Tavolo and Lausus, have organized themselves into the Tavolo Community Conservation Association, with the objective to conserve and protect the natural forests on their community lands. The Tavolo Project Area covers a total of 21,782 ha, out of which 16,141 ha (74%) is currently planned to be deforested and converted into agriculture and other land uses under the Mukus-Melkoi SABL and the Kakuna-Lote Project. The Tavolo Community is working together with FORCERT to prevent the deforestation of their forest lands by implementing the following project activities:

1.11.1 Mukus-Melkoi SABL Court Case

The whole of the Tavolo Project Area falls under the Mukus-Melkoi SABL area, which was initially granted in 2008 to a landowner company called RERA Holdings Ltd (RHL) for a period of 99 years. The Tavolo Community never gave their consent for their land to be included in the Mukus-Melkoi SABL. Besides the SABL the Tavolo Community also never gave their consent for a large scale deforestation and land use conversion under the Kakuna-Lote project on their land. Therefore the Tavolo Community is taking the matter to court to stop the Kakuna-Lote Project and its underlying FCA, and to get the Mukus-Melkoi SABL nullified to prevent the development of any other deforestation plans in the area in the future. The challenges for customary landowning communities to take on legal battles with large multinational companies and the state are very big, in particular to finance costs involved such as lawyers' fees, meeting logistical costs for movement of plaintiffs and witnesses to and from the provincial capital Kokopo (where a National Court resides), and lastly costs involved for gathering of documents and other evidence required for the case. Through individual family contributions, the Tavolo Community has fundraised the required PGK10,000 deposit for their selected lawyer to accept

the case and the pre-financing support from Greenchoice to the Tavolo Community will allow them to complete the case.

1.11.2 Tavolo Community Sustainable Land Use Plan and Conservation Laws

A High Conservation Value (HCV) assessment was completed by the Tavolo Community, facilitated by FORCERT. Upon the completion of the assessment, community conservation laws were drawn up with also laws being added that include development of enforcement strategies. The laws are endorsed by all the clans involved in the Tavolo Project Area. The Tavolo Community will seek official recognition for the community conservation laws from the Melkoi Local Level Government and through annexing the laws to their Conservation Deed. The implementation and enforcement of the Community conservation laws is governed by the Tavolo Community Conservation Committee, consisting of representatives of all clans involved.

The existing Tavolo Community Sustainable Land Use Plan (LUP) was revised following completion of the HCV assessment and Community conservation Laws. There are few changes to the land use zones following from discussions based on satellite images and ground truthing, done with assistance from FORCERT officers. The LUP and the Community conservation laws will guide the community to themselves promote and strengthen conservation and sustainable management of their natural resources. They will be evaluated and if found necessary revised by the Tavolo community every 10 years, in line with the VCS baseline revision process.

1.11.3 Benefits from Environmental Service Trust (BEST) for PNG communities

FORCERT will establish the PNG Communities Benefits from Environmental Services Trust (PNG Communities BEST) as a general Service Trust for the local communities (their partners), and for which sufficient finance is available in the Trust to guarantee a minimum of 10 years of annual benefit payments to the communities.

The PNG Communities BEST will be managed by a reputable independent financial management entity, and will hold all funds received for specific environmental services provided and any other financial support for the conservation efforts of the member communities. This independent management will be established once the PNG Communities BEST has sufficiently grown in size, i.e. community membership and annual income, to warrant the expenses of engaging these management services, or if and when the planned PNG Biodiversity Fund would prove to be available and suitable to take on this task. At the start of PNG Communities BEST, with for now only the Tavolo Community Conservation Association as its first community member, and the Tavolo VCS REDD project VCU sales as its sole income source, funds will be managed by FORCERT in accordance with their strict financial procedures, overseen by the FORCERT Board of Directors, and kept strictly separated from other FORCERT funds. This financial management arrangement has been agreed to by the Tavolo Community.

General benefit sharing under the Trust has already been agreed to and results from various round of community discussions with the Tavolo Community and two other trial communities.

This general break-up is as follows:

- 10% to Government (5% Local Level, 3% District, 1% Provincial & 1% National)
- 20% to supporting organizations (FORCERT and Face the Future)
- 70% to the landowning community

NB: The proposed Government tax division is preliminary, as discussions are ongoing with the Climate Change & Development Authority (CCDA) as part of FORCERT's MOU with CCDA on its PNG Communities BEST development and trialling work, and also as part of the stakeholder consultations on the National REDD+ Benefit Sharing Distribution System, and the related regulations for nesting of voluntary carbon market projects in the country. The Government may increase its tax percentage to 15%, which would mean that the percentage going to the landowning community would be decreased to 65%, as the 20% to supporting organizations is seen as a minimum required percentage necessary to cover all project design, implementation, maintenance and monitoring costs.

The Tavolo community has decided to allocate their 70% community benefits to the following seven funds:

- Community service projects
- School fee/education
- Health care costs
- Support for family income earning options
- Community organization (legal entity) management costs
- Emergencies
- Investment

Other communities that may join the PNG Communities BEST under new projects, will evaluate and discuss if these seven funds would also suit them as the best allocation for their community benefits, or whether their specific situation would require a different set of funds.

Please note that this benefit sharing system does not include direct cash payment to families or individuals, while still catering for financial support to families and individuals for important areas such as school fees and health care. Also it includes financial support to families to develop and support income earning options/small business.

The reason for not including direct cash payment to families or individuals in our benefit sharing system is that this will only create dependency, division, discrimination and exclusion, increase the danger of domestic violence, and even stimulate population growth (if also children are included in the cash distribution). Also it may lead to outside people trying to trace themselves back to the clan/ILG involved, to claim clan/ILG membership, or clan leaders offering inclusion as beneficiaries to complete outsiders through so called "buying of shares".

Another important consideration is that the benefits received are generated through the commitment by the resident population of the communities within the project area to develop and maintain compliance with their sustainable land use plan and community conservation laws. This means that the benefit sharing system should focus on funds that will directly impact their lives in the community, as this will enable them to guarantee the permanence of their commitment to look after their forests. It also means that benefits should be guaranteed for the full 30 year period of the project, with their annual release being linked to evidence of the community commitment under the project, i.e. their continued compliance with their sustainable land use plan and community conservation laws.

The PNG Communities BEST benefit sharing system does allow for genuine existing clan members living elsewhere to still be considered in the benefit sharing, e.g. through the Education, Health, or family business support funds, something which can be decided upon by all clans involved.

There will be annual benefit disbursements in equal amounts¹ for the 30 year duration of the PNG Communities BEST agreement signed with the community, based on secured income into the PNG Communities BEST. The decision on the actual breakup of the annual amount received by the participating community over the various "baskets" for each year, is with the community. Also the management of the use of the funds for each basket is organized and implemented by the community itself, except for the Investment basket, which will be managed at the PNG Communities BEST level. The option of organizing and safeguarding advanced disbursements for identified larger community service projects is still being investigated.

There will be annual public community meetings, at each of the participating communities, in which FORCERT will report back to the community on the management of the PNG Communities BEST, including its finances, with full disclosure of all VCU sales, and the community management committee will give their management and finances report back to FORCERT. For these presentations both FORCERT and the community management committees will use our so called Moni Stori Tool, i.e. pictorial presentation of financial information, allowing easy understanding, also by people that are less financially literate. The community will decide on the monitoring and reporting intensity for each of the individual funds, back to their own management committee and the overall community.

FORCERT will comply with the monitoring and reporting requirements of VCS, and with the annual reporting requirements of CCDA under the CCMA and the yet to be finalized REDD+ project regulations or guidelines. The current applicable government reporting requirements can be found in Section 1.14 below.

1.11.4 Formal Protection Status

¹ Annual benefit distribution amounts will be based on actual sales, so over time the average annual amounts may increase or decrease.

The Tavolo Community is looking at extending their current Wildlife Management Area (WMA) of only 2,400 ha to cover the whole of the Tavolo Project Area, however their application for this extension with the Conservation & Environmental Protection Authority (CEPA) has not been processed. Therefore the Tavolo Community has now put their whole LUP area under a Conservation Deed, which was signed in November 2019.

1.12 Project Location

The Tavolo Project Area is located in East New Britain Province, on the South Coast of the island of New Britain, Papua New Guinea (PNG). It is formed by the customary lands of three different communities, namely Mukus, Tavolo and Lausus. The customary land under the Land Use Plan of these three communities covers a total area of 21,782 ha. 84% (18,355 ha) of these lands are classified as forest cover in the PNG Forest Basemap 2012. Out of these forest lands 16,141 ha is currently zoned to be deforested under the Mukus-Melkoi SABL as part of the Kakuna-Lote FCA Project (see section 4.1). The Tavolo REDD project aims to stop the planned deforestation in The Tavolo Project Area. The boundaries of the Tavolo Project Area are given in Figure 1. The project is not located within a jurisdiction covered by a jurisdictional REDD+ program.

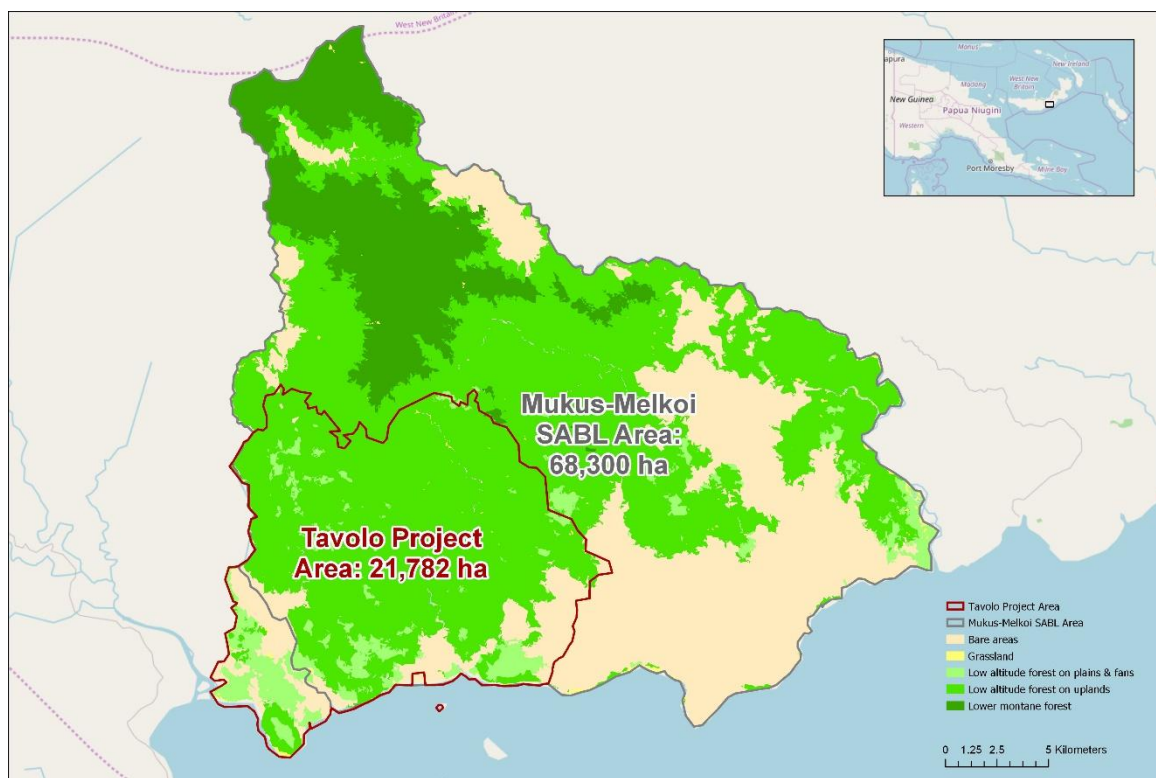


Figure 1 - Map with the geographical boundary of the Tavolo Project Area (in red)

1.13 Conditions Prior to Project Initiation

1.13.1 Climate

New Britain has the mean maximum temperatures of 28-34 °C while mean minimum temperatures are of 20-25 °C. The Island has a tropical rainforest climate, with annual rainfall of 5,000-7,000mm, with heaviest and most frequent rainfall occurring on the South Coast between May and October. The Weather is also affected by the Monsoon and South West Trade Winds.

1.13.2 Topography

The southernmost part of the Tavolo project area is a relatively flat coastal zone of uplifted coral and river deposits. Moving inland this gives way to undulating hills of up to 600 m and gradually changes into the mountains. At the crest is the Nakanai Range and of below stretches mountains that have altitudes of up to 1200m. Slopes range between 0 and 30°, but mostly vary between 0 and 15°. The steepest slopes can be found around the river valleys of Tavolo.



Figure 2 – Tavolo Elevation Map

1.13.3 Hydrology

Tavolo is located in the watersheds of the Wala, Ania, Mukus and Melkoi rivers of the East New Britain Province of Papua New Guinea. There are four rivers identified as important water resources, which are Tavolo, Eunga, Takai and Mukus. These water courses are used particularly for drinking, washing, ease of transport accessibility and sources for protein.

1.13.4 Soils

Based on Bleeker (1983) the inland soils can be characterised as being dystic Cambisols, Regosols or orthic Acrisols (classified with nr. 10 / brown colour in the map below). The soils on the coast are mainly characterised as gleyic Fluvisols, eutric Histosols or eutric Fluvisols (classified with nr. 14 / green colour in the map below).



Figure 3 - Map depicting the major soil types in and around the project area. Derived from Soil map of Bleeker (C.S.I.R.O.)¹

1.13.5 Ecoregion

The majority of the project area is classified under the WWF Terrestrial Ecoregions as “New Britain-New Ireland Lowland Rain Forests”. The upper part of Tavolo however is classified as “New Britain-New Ireland Montane Rain Forests”. Both types fall under the tropical moist forest ecoregion.

1.13.6 PNG National Forest Classification

More than 75% of the project area is covered with forest. PNG Forest Basemap 2012 classifies most of the forest in the project area as Low altitude forest on uplands (see Figure 1). A small proportion is classified as Low altitude forest on plains and fans. The remaining area, which includes cleared forest, agricultural fields and residential areas are grouped under ‘bare areas’.

1.13.7 Vegetation types

¹Available at: https://esdac.jrc.ec.europa.eu/ESDB_Archive/EuDASM/Asia/lists/k10_cpg.htm

The following main forest types can be identified for the project area, as per the PNG National Forest Inventory (NFI) stratification;

1. Low Altitude Forest on Plains and Fans

The forest is found below 1000m elevation which composes of medium to large crowned forests. The main two species includes *Pometia pinnata* (Taun) and *Homalium foetidum* (Malas) are that dominate the canopy with under growth of vines, palms, scrubs and rattans. Apart from these there is a small parcel of *Eucalyptus deglupta* (Kamarere) stand found along the Mukus river.

2. Low Altitude Forest on Uplands

This forest comprises of medium to large forest with even canopy, with *Castanopsis*, *Nothofagus* or *Araucaria*. Tree species of *Ficus spp*, *Alstonia scholaris* and *Terminalia spp* make up the upper storey and with *Instia spp*, *Petrocarpus indicus*, *Anisoptera thurifera* and *Hopea spp* found on the ridges and foot hills.

3. Lower Montane Forest

This forest is found above the elevation of 1000m which composes of small crown forests with *Casuarina papuana*, *Nothofagus* and *Araucaria spp* found.

Additional to these main forest types under the NFI, though observations on the ground, also small areas of the following forest types have been identified:

- Mangrove; This forest type occurs mainly at the coastal zone with the estuarine community but this is only a very small area at the Tavolo river mouth which is composed mainly of *Rhizophoraceae*.
- Coastal regrowth forest; where forest has changed by former garden or cocoa blocks resulting in secondary tree species like *Callophyllum*, *Euodia*, *Artocarpus*, *Terminalia*, *Canarium* and *Octomeles* etc.
- Coastal Strandline Forest; dominated by species such as *Callophyllum inophyllum*, *Cordia subcordata* and *Hibiscus tiliaceus*.

1.13.8 Present condition of the forests in the project area

As described in section 3.3.3 and shown in the Tavolo Land use map in Figure 7, most of forest in the project area is allocated under conservation. Apart from the gathering of non-timber forest products, fishing and hunting for domestic and cultural uses, these forests have experienced little human intervention and can be considered as untouched natural forest. Forest areas allocated as production forest and conversion zone are predominantly secondary forest which are generally lower stocked.

While surrounding communities with lands under a comparable SABL scheme have experienced vast deforestation, Tavolo has to date managed to conserve their forest and has managed it sustainably, without any significant degradation or loss of forest over the past 20+ years (see Figure 4). The community plans to strengthen their conservation efforts for the long term

through the project activities as detailed in section 1.11. The threats to the forests in the projects area are described in detail in section 3.4.

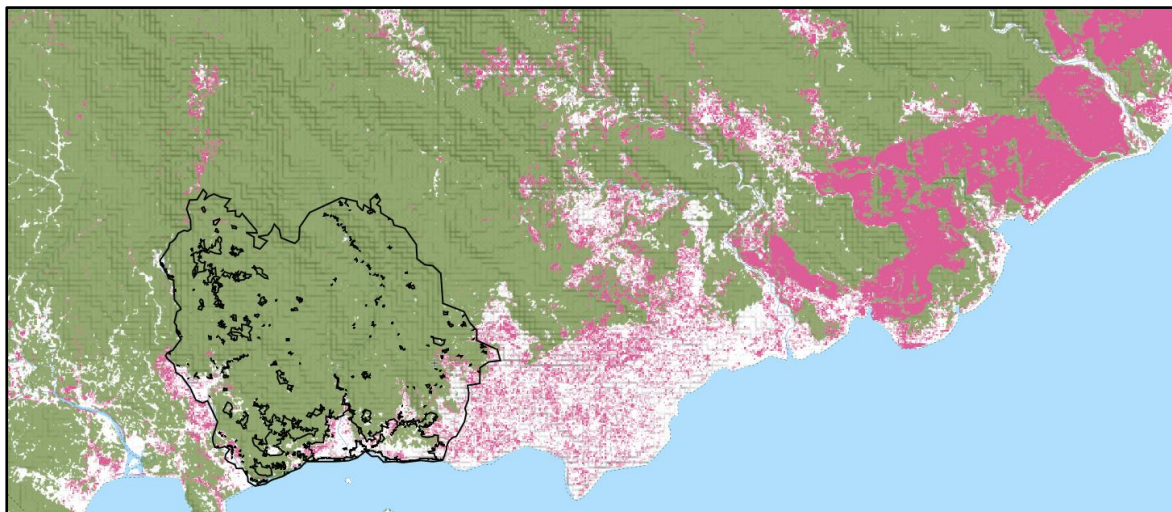


Figure 4 - Map of tree cover loss between 2000 and 2020, extract from Global Forest Watch. While the project area shows no significant degradation or loss of forest, the communities in the adjacent district Pomio have lost a huge part of their forest in recent years (2011-2020) due to clearcutting operations under an SABL scheme

1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks

All project activities described in this PD are in compliance with all and any relevant local, regional and national laws, statutes and regulatory frameworks. Below the most important laws and regulations are mentioned, with a short description of the part most appropriate to the project activities. It should be noted that some of these are still in (final) draft form and at this moment in time not yet legally binding or enforceable, but all of their main requirements and intents will still be met as much as possible.

National Climate Compatible Development Management Policy

1. Partnership Policies:

a. Equitable, Effective Participation: Networking, coordination, and equitable engagement with and between multiple stakeholders through active participation, consultation and engagement at national and subnational levels in all climate change programs, incentives and activities.

2. Partnership Strategies:

a. Community Partnerships: Promote recognition and respect of community rights, support for improved community climate change outcomes, and information sharing and collaborative partnerships for community climate risk management.

2.1 Gender-Balanced Decision-Making: Ensure gender balance in all community, national and sub-national decision-making processes.

2.4 Civil Society, Churches and Private Sector Partnerships: Encourage collaboration between government, civil society, churches and private sector through innovative approaches (e.g. MoUs and public private partnerships).

Climate Change Management Act (2015, under revision)

- Clause 60: use UNFCCC processes or procedures for verification.
- Clause 87: Landholder consent to be obtained through FPIC.
- Clause 88: Rights of customary landholders shall be fully recognised and respected in all transactions affecting the customary land.
- Clause 89: Obtaining consent of customary landholders; (1) land groups to be incorporated as ILG's for any climate change project agreement, or (2) without ILG if 85% of the adult members of each land group gave FPIC.
- Clause 90:
 - 1) A climate change related project agreement shall
 - a) be in writing; and
 - b) specify the monetary and other benefits, if any, to be received by the landholders, as prescribed under Part IX, in consideration for the rights granted; and
 - c) specify the nature of project in the area covered by the agreement; and
 - d) specify a term of sufficient duration in order to allow for proper project management measures to be carried out to completion; and
 - e) be accompanied by a map showing clearly the boundaries of the area covered by the agreement; and
 - f) specify any other climate compatible or green growth related land use options, if any.
 - 2) An agreement under Subsection (1) shall be lodged with the Office of State Solicitor for necessary legal clearance before execution.
 - 3) A copy of a duly executed agreement together with a copy of the legal clearance issued under Subsection (2) shall be lodged with the Authority.
 - 4) The Board may, from time to time, determine appropriate lodgement fees in relation to the lodgement of a copy of an agreement.
 - 5) An agreement under Subsection (1) shall comply with the requirements under Subsections (2), (3) and (4) and failure to comply with any one or more of those

requirements shall render the agreement under Subsection (1) in valid and unenforceable for all intents and purposes.

- Clause 93:
 - 1) This Part applies to the participation and benefit sharing or allocation of incentives for climate change related projects or activities.
 - 2) All affected landholders shall participate and benefit from the incentives of a climate change related project implemented on land or at sea.
 - 3) Unless a law provides to the contrary, a Regulation shall provide for the participation and benefit sharing or incentive allocation mechanism under this Part.
- Clause 94:
 - 1) The Authority or any person or entity who undertakes a climate change related project shall use every reasonable means to quantify the net income or net benefits (as the case may be) and present an annual report before or by 31st March of each calendar year to the concerned landholders and the Authority and relevant provincial governments.
 - 2) An abstract or summary of the report under Subsection (1) shall be published at least twice in a daily newspaper circulated nationwide.
 - 3) An annual report produced under Subsection (1) is a public document for all intent and purposes.

Papua New Guinea's National REDD+ Strategy (2017)

The development of the PNG Communities BEST REDD Project targeting the voluntary carbon market is in line with the national approach to REDD+ as set out by the Government of Papua New Guinea in their National REDD+ Strategy 2017-2027, as it states:

*"The Government will not seek to develop or promote the development of REDD+ Projects targeting the voluntary carbon market. The government will, however, consider project proposals from landholders, private sector actors and NGOs who are able to demonstrate clear competencies within the areas of project development, secure long term financial investment and a strong commitment to the ongoing support and development of communities within the project location."*¹

Furthermore, the PNG Communities BEST REDD Project is developed in close cooperation with the Climate Change and Develop Authority (CCDA) of the Government of Papua New Guinea as can be seen in the MoU between FORCERT and the CCDA in Appendix 1 of this PD.

¹ Government of Papua New Guinea, 2017. Papua New Guinea National REDD+ Strategy for the period 2017-2027, Papua New Guinea, p22.

The development of this project is also in accordance with the other conditions set out in the National REDD+ Strategy for the development of projects targeting the voluntary market.

Papua New Guinea's National REDD+ Project Guidelines (Final draft 2012, under revision)

All requirements to be met (aim is to meet both mandatory and additional voluntary requirements).

Specific important mandatory requirements to consider a/o relating to legal status and finances are the following:

- Project Design Principles / Project Design Document to: 11. Demonstrate that financial mechanisms adopted, including projected revenues from emissions reductions and other sources, are likely to provide an adequate flow of funds for project implementation and to achieve the anticipated climate, community and biodiversity benefits.
- C. Management Capacity & Best Practices: 7. Document the financial health of the implementing organization(s) to demonstrate that financial resources budgeted will be adequate to implement the project. This will be kept confidential.
- D. Legal Status & Property Rights: 2. Show evidence that all relevant communities, Local Level Government, Provincial Administrators, and relevant National Government Departments, such as PNG Forestry Authority, Department of Agriculture and Lands, Department of Planning, Department of Environment and Conservation etc, are aware of the project and have given their '**approval in principle**' for the development of the Project Design Document. Where this approval in principle has been refused the proponent must seek clarification, and where possible, demonstrate that changes have been made to the project design to address concerns raised.

Additional voluntary criteria:

- Fiduciary Safeguards:
 1. *A-Business plan metrics:* The project proponents must: 1. Indicate a budget and business plan for the project's first five years (or length of total project if it is shorter than five years); 2. Show key financial performance indicators, e.g., breakeven value or expected tax payment every year.
 2. *B- Annual audit:* The project proponents must confirm by statement of commitment to conduct annual independent audits that will be presented to the OCCD

Papua New Guinea's REDD+ Free, Prior and Informed Consent Guidelines (Final working draft 2014, under revision)

All requirements of 5.6.3 *Section C: Implementing FPIC at the Project Level* will be met.

Draft National BSDS (Draft 2 April 2015, under development)

Suggested Principals of a Benefit Sharing and Distribution System for PNG:

- **Transparent and Independent Functions** –the functions of benefit distribution must be independent from the functions of REDD+ fund management and financial transactions so as to

prevent any conflict of interest. Both of these functions are monitored by an independent third party to ensure quality and integrity of the entire system.

- **Timeliness** –Beneficiaries should not have to wait extended periods of time to receive benefits. The longer they wait, the weaker the economic incentive becomes.
- **Effectiveness** –The benefits must create an incentive to result in sustainable forest management practices
- **Equity** –all beneficiaries must be treated fairly. If the distribution of the benefits create winners and losers then the incentives will fail. Measures to promote equity are greatly facilitated by transparency and broad-based participation.
- **Efficiency** –if costs incurred in managing a REDD+ programme are too high, the total benefits available for providing positive incentives is reduced, and the conditions of adequacy will be compromised.
- **Flexibility** –The Incentives to communities to sustainable manage forests will vary from place to place depending on local cultural, environmental, and socio-economic circumstances. There is no “one-size-fits-all” BSDS. The type, frequency and size of the incentives, and the design of the Distribution System needs to incorporate local decision-making.

Papua New Guinea’s National REDD+ Forest Reference Level (2017)

The quantification of GHG emissions and removals and the monitoring plan presented in this PD follows the guidelines given in Papua New Guinea’s REDD+ Forest Reference Level Document, submitted to the UNFCCC in 2017.

PNG Constitution (1975)

National Goal No.4 National Resources and Environment;

We, the people of Papua New Guinea declare our fourth goal to be for Papua New Guinea’s natural resources and environment to be conserved and used for the collective benefit of all, and be replenished for the benefit of future generations.

1.15 Participation under Other GHG Programs

1.15.1 Projects Registered (or seeking registration) under Other GHG Program(s)

The Tavolo REDD Project has not been registered, or is not seeking registration under any other GHG programs.

1.15.2 Projects Rejected by Other GHG Programs

The Tavolo REDD Project has not been rejected by any other GHG programs.

1.16 Other Forms of Credit

1.16.1 Emissions Trading Programs and Other Binding Limits

The Tavolo REDD Project will not participate in an emissions trading programme or any other mechanism that includes GHG allowance trading.

1.16.2 Other Forms of Environmental Credit

The Tavolo REDD project has not sought or received another form of GHG-related environmental credit.

1.17 Additional Information Relevant to the Project

1.17.1 Leakage Management

<TBD>

1.17.2 Commercially Sensitive Information

<TBD>

1.17.3 Sustainable Development

<TBD>

1.17.4 Further Information

<TBD>

2 SAFEGUARDS

2.1 No Net Harm

<TBD>

2.2 Local Stakeholder Consultation

<TBD>

2.3 Environmental Impact

<TBD>

2.4 Public Comments

<TBD>

2.5 AFOLU-Specific Safeguards

<TBD>

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

The Tavolo REDD Project is designed for validation under the Verified Carbon Standard Version 3.7 and AFOLU Requirements Version 3.6.

The project applies VM0007 REDD+ Methodology Framework (REDD-MF) version 1.5 (<https://verra.org/methodology/vm0007-redd-methodology-framework-redd-mf-v1-5/>). Under this REDD Methodology Framework, the following modules and tools are applied by the project:

	Modules/Tools
Additionality	CDM Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities (T-ADD), v1
Permanence	VCS AFOLU Non-Permanence Risk Tool, v3.3 (T-BAR)
Baseline	VMD0006 Estimation of baseline carbon stock changes and greenhouse gas emissions from planned deforestation and planned degradation (BL-PL), v1.2
Carbon pool above- and belowground biomass	VMD0001 Estimation of carbon stocks in the above- and belowground biomass in live tree and non-tree pools (CP-AB), v1.1
Carbon pool wood products	VMD0005 Estimation of carbon stocks in the long-term wood products pool (CP-W), v1.1
Leakage	VMD0009 Estimation of emissions from activity shifting for avoided planned deforestation (LK-ASP), v1.2
Emissions	VMD0013 Estimation of greenhouse gas emissions from biomass and peat burning (E-BPB), v1.1
Monitoring	VMD0015 Methods for monitoring of greenhouse gas emissions and removals (M-MON), v2.1
Stratification	VMD0016 Methods for stratification of the project area (X-STR), v1.1
Uncertainty	VMD0017 Estimation of uncertainty for REDD project activities (X-UNC), v2.1

Significance

CDM Tool for testing significance of GHG emissions in A/R CDM project activities (T-SIG), v1

3.2 Applicability of Methodology

As described underneath, the project activities for the Tavolo Project Area meets each of the applicability conditions of the VM0007 REDD+ Methodology Framework and the different tools and modules applied by the project. The project qualifies as a REDD project under the VM0007 REDD-MF because:

- Land in the Tavolo Project Area has qualified as forest (following the definition used by VCS) at least 10 years before the project start date;
- There are no peat soils present in the Tavolo Project Area;
- Baseline deforestation and forest degradation in the project area falls within the category of Planned deforestation/degradation (VCS category APD);
- Leakage avoidance activities by the project does not include either agricultural lands that are flooded to increase production (e.g. paddy rice), or intensifying livestock production through use of feed-lots and/or manure lagoons;
- The project proponents can show ownership of the project site and ownership of the carbon rights for the project area;
- The proposed project activities within the project area will not lead to violation of any applicable law even if the law is not enforced.

The project qualifies as an Avoided Planned Deforestation/Degradation project (VCS category APD) because:

- The conversion of forest lands to a deforested condition in the Tavolo Project Area is legally permitted under the Mukus-Melkoi SABL;
- Project documentation is available to clearly demonstrate that the land in the project area would have been converted to non-forest use if not for the REDD project.

3.3 Project Boundary

3.3.1 Geographical Boundary REDD Project Area

As described in section 1.12 the Tavolo Project Area includes a total area of 21,782 ha out of which 16,141 ha of forest cover is currently planned to be deforested as part of the Kakuna-Lote FCA project under the Mukus-Melkoi SABL. The geographical boundary of the Tavolo Project Area is presented in Figure 5 underneath.

The Global 2010 Tree Cover dataset, which is available on the Global Forest Watch (GFW) platform online¹, shows that the Tavolo Project Area includes only land qualifying as forest for a minimum of 10 years prior to the project start date. The forest cover in 2010 within the Tavolo Project Area is visualized in Figure 6.

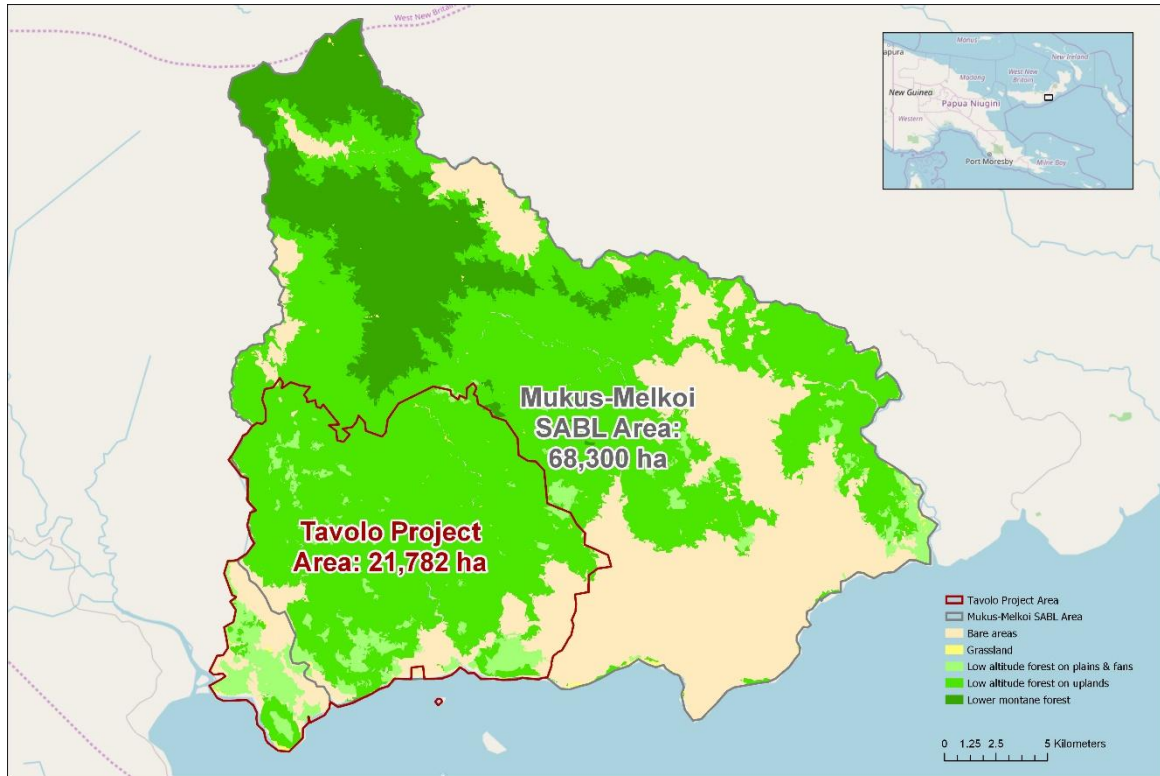


Figure 5 - Map with the geographical boundary of the Tavolo Project Area (in red)

¹Hansen, et al., 2013

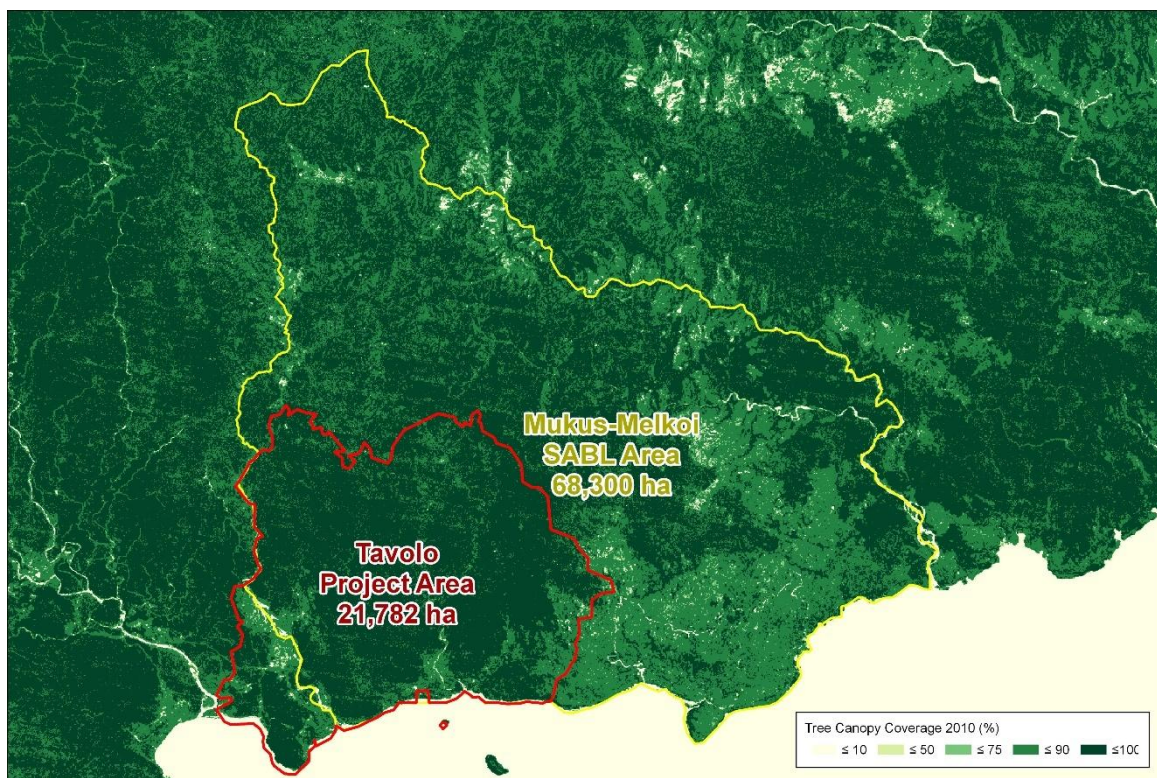


Figure 6- Forest cover in 2010 in the Tavolo Project Area

3.3.2 Carbon Pools and Sources of GHG Emissions

The carbon pools and the GHG emission sources included in or excluded for the Tavolo REDD Project activity are shown in Table 1 and Table 2 below.

Table 1 - Carbon Pools and sources of GHG emissions in the Baseline Scenario

Source		Gas	Included?	Justification/Explanation
Baseline scenario	Aboveground tree biomass	CO ₂	Yes	This is a mandatory pool
		CH ₄	No	
		N ₂ O	No	
		Other	No	
	Aboveground non-tree biomass	CO ₂	No	The carbon stock in this pool is conservatively excluded.
		CH ₄	No	
		N ₂ O	No	
		Other	No	
	Belowground tree biomass	CO ₂	Yes	The carbon stock in this pool is calculated based on the aboveground tree biomass pool

Source		Gas	Included?	Justification/Explanation
		CH ₄	No	
		N ₂ O	No	
		Other	No	
	Soil Carbon	CO ₂	No	The carbon stock in this pool is conservatively excluded
		CH ₄	No	
		N ₂ O	No	
		Other	No	
	Dead Wood	CO ₂	No	The carbon stock in this pool is conservatively excluded
		CH ₄	No	
		N ₂ O	No	
		Other	No	
	Harvested Wood Products	CO ₂	Yes	The carbon stock in this pool is conservatively included since the carbon storage in the baseline scenario is likely to be a significant pool since large scale deforestation and exportation of timber is expected in the baseline
		CH ₄	No	
		N ₂ O	No	
		Other	No	
	Litter	CO ₂	No	The carbon stock in this pool is conservatively excluded
		CH ₄	No	
		N ₂ O	No	
		Other	No	
	Biomass burning	CO ₂	No	The carbon stock in this pool is conservatively excluded
		CH ₄	No	
		N ₂ O	No	
		Other	No	
	Combustion of fossil fuels	CO ₂	No	The carbon stock in this pool is conservatively excluded
		CH ₄	No	
		N ₂ O	No	

Source		Gas	Included?	Justification/Explanation
	Use of fertilizers	Other	No	
		CO ₂	No	The carbon stock in this pool is conservatively excluded
		CH ₄	No	
		N ₂ O	No	
		Other	No	

Table 2 - Carbon Pools and sources of GHG emissions in the Project Scenario

Source		Gas	Included?	Justification/Explanation
Project scenario	Aboveground tree biomass	CO ₂	Yes	This is a mandatory pool
		CH ₄	No	
		N ₂ O	No	
		Other	No	
	Aboveground non-tree biomass	CO ₂	No	The carbon stock in this pool is conservatively excluded.
		CH ₄	No	
		N ₂ O	No	
		Other	No	
	Belowground tree biomass	CO ₂	Yes	The carbon stock in this pool is calculated based on the aboveground tree biomass pool
		CH ₄	No	
		N ₂ O	No	
		Other	No	
	Soil Carbon	CO ₂	No	The carbon stock in this pool is conservatively excluded
		CH ₄	No	
		N ₂ O	No	
		Other	No	
	Dead Wood	CO ₂	No	The carbon stock in this pool is conservatively excluded
		CH ₄	No	

Source		Gas	Included?	Justification/Explanation
		N ₂ O	No	
		Other	No	
	Harvested Wood Products	CO ₂	Yes	The carbon stock in this pool is conservatively included since the carbon storage in the baseline scenario is likely to be a significant pool since large scale deforestation and exportation of timber is expected in the baseline
		CH ₄	No	
		N ₂ O	No	
		Other	No	
	Litter	CO ₂	No	The carbon stock in this pool is conservatively excluded
		CH ₄	No	
		N ₂ O	No	
		Other	No	
	Biomass burning	CO ₂	No	The carbon stock in this pool is conservatively excluded
		CH ₄	No	
		N ₂ O	No	
		Other	No	
	Combustion of fossil fuels	CO ₂	No	The carbon stock in this pool is conservatively excluded
		CH ₄	No	
		N ₂ O	No	
		Other	No	
	Use of fertilizers	CO ₂	No	The carbon stock in this pool is conservatively excluded
		CH ₄	No	
		N ₂ O	No	
		Other	No	

3.3.3 Project Map

On the map presented below (*Figure 7*) the geographical boundaries are presented of the different project activities taking place within the Tavolo Project Area. The following zones are defined:

1. Forest Conservation Zone: Forest areas under full conservation protection. Gathering of non-timber forest products, fishing and hunting for domestic and cultural uses may take place, provided this is done in accordance with the Community conservation laws.
2. Forest Production Zone: Forest areas designated for small-scale portable sawmilling operations in accordance with Forest Stewardship Council certification requirements. Gathering of non-timber forest products, fishing and hunting for domestic and cultural uses may take place, provided this is done in accordance with the Community conservation laws.
3. Garden and Cash Crop Zone: Areas currently in use for family food gardens and small scale agricultural plots for various cash crops (a/o betelnut and cocoa).
4. Conversion Zone: Allocation of current forest areas for potential future conversion to garden or cash crop areas, as and when needed due to increasing population numbers. An assessment has been made to ensure the conversion of these areas does not affect the maintenance and management of identified High Conservation Values.

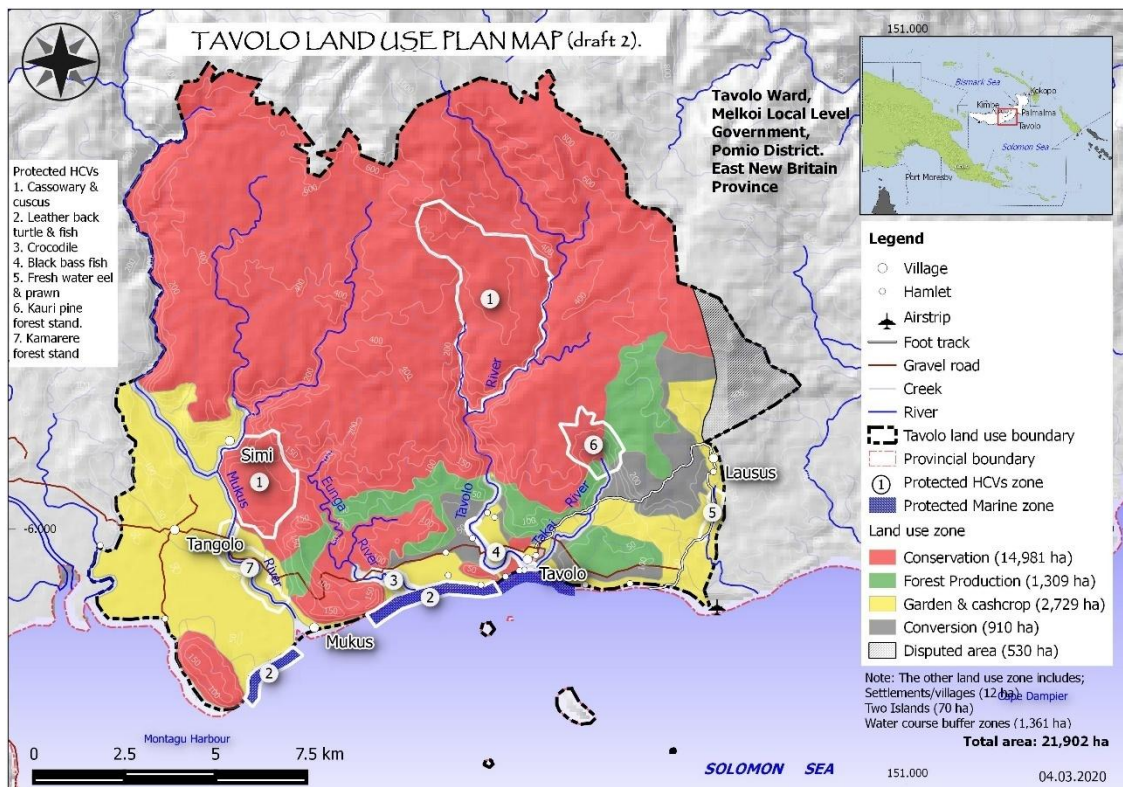


Figure 7 - Tavolo Land Use Map

3.4 Baseline Scenario

3.4.1 Context of Deforestation in PNG

Almost all land in PNG (97%) is held under customary tenure and approximately 99% of the forest lands are owned by customary landowners¹. This right to land ownership and use by local landowners is recognized in PNG's Land Act 1996. However, while the formal land rights lie with the communities and prior, informed consent of customary landowners is required, the systems whereby rights to selectively log and clear-fell customary owned forests are obtained do not work properly. Large areas of land are zoned by the Government of PNG as Forest Concessions (FC) or Special Agricultural Business Leases (SABL) and to a smaller extent (and on a smaller scale) 'mini-estates' for establishment of agriculture or forestry plantations. A recent development is the issuance of Forest Clearing Authorities (FCAs) directly to Incorporated Land Groups or Land Owner Companies, who have struck deals with companies for clear felling of their forest allegedly for agricultural or forest plantation development. Some form of written consent is normally obtained, but very often the process by which consent is given is seriously flawed, with local people not sufficiently informed or with individuals who do not represent the views of the community as a whole.² Licenses to operate are often obtained by companies, with the help of government officials, from individuals that claim they represent the community/land owners, but that actually do not have a mandate to operate on the community's behalf.

The current forestry legislation (Forestry Act 1991) provides for the utilization of forest resources under three (3) different project types:

1. Forest Management Agreement (FMA):

Under the FMA process, the state acquires the right to harvest timber from customary owners. The state then issues a timber permit to a timber operator. These areas are zoned as Forest Concessions. These concessions are intended to be selectively logged, however logging intensity in most cases is far from sustainable and leads to forest degradation.

2. Timber Authority (TA):

Is designed for small scale operations and small-scale forest clearances (road line or agriculture or other land use, less than 50ha) and can only be issued for areas that are not covered by a current FMA or TRP.

3. Forest Clearing Authority (FCA):

The FCA was created in 2000 when section 90 of the Forestry Act 1991 was amended to cater for large scale agricultural and infrastructural projects that involve the clearance of large tracts of forests (which is a contradiction of the Forestry Act's stated aim of securing

¹ GIZ, 2014

² Chatham House, 2014

the sustainable use of PNG's forests). This is the only arrangement that allows for the large scale clearing of forests.

There also still are current old type licenses called Timber Rights Purchases (TRPs) and Local Forest Areas (LFAs). Many expired TRP's have recently been renewed, following a much criticized Supreme Court decision on one expired TRP area, which is used as a precedent to get renewals on often long term expired TRPs.

The below image depicts the proportion of log exports per project type in m3 in 2017.

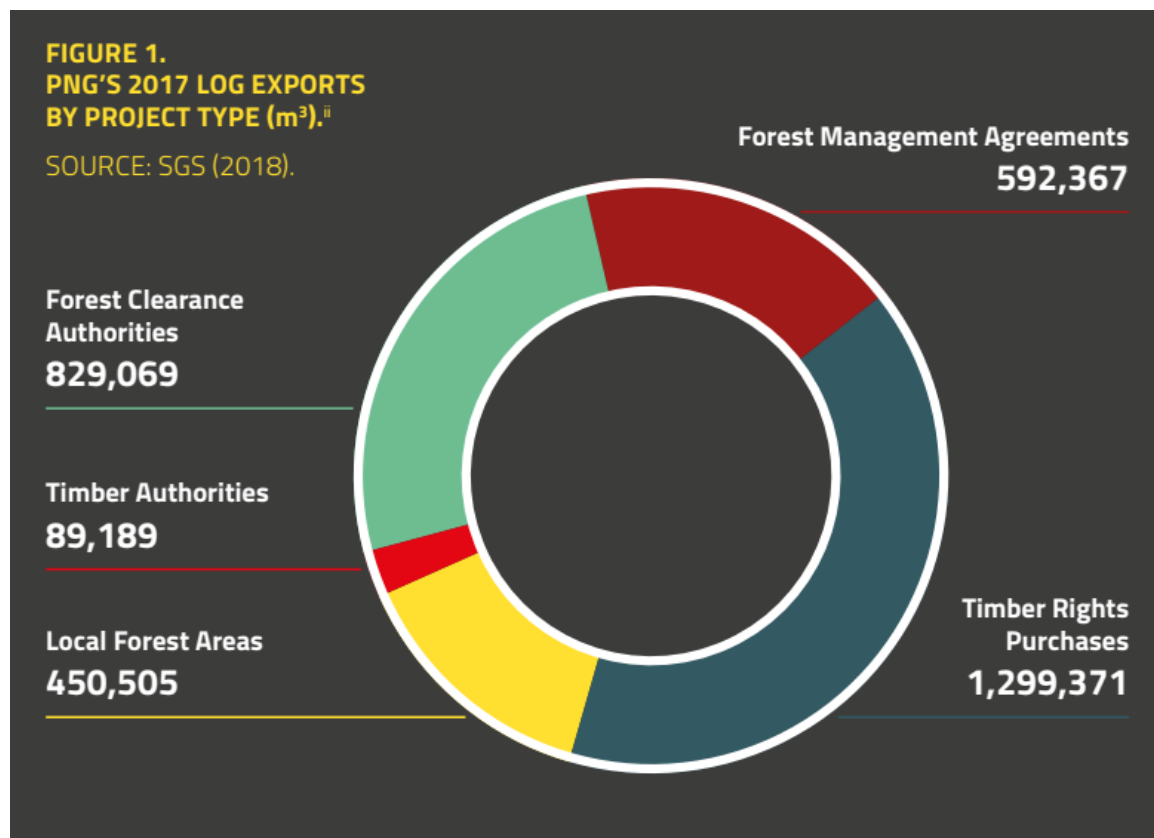


Figure 8 - PNG's 2017 log export by project type (Source: Global Witness, 2018)

There exists overlap of areas gazetted under different project types. A large proportion of PNG's forests is gazetted as logging concession (under FMA, TRP or LFA). These concessions often overlap with areas that are granted an FCA.

In this grouped project we limit our scope for the baseline activities to the customary forest lands:

1. Which have a documented threat for reforestation, leading to issuance of a Forest Clearing Authority (FCA) by the PNGFA;
2. Which is challenged by the customary landowners;

3. Which results in conversion of forest to agriculture (including plantations) or forest plantations.
4. For which the baseline agents of deforestation are : an Incorporated Land Group (ILG) or Land Owner Company (LOC) of customary landowners, together with a third party company, who implements the forest clearing and subsequent agricultural development or forest plantation.

The original primary scheme that resulted in the granting of FCA's is the Special Agriculture and Business Lease (SABL). The lease-leaseback arrangement under the SABLs involves first the establishment of an Incorporated Land Group (ILG) by the customary landowners. This enables them to lease it to the national government, facilitated through the Ministry for Lands and Physical Planning (the 'head lease'). The Ministry issues an SABL for that parcel of land back to the ILG without rent payable generally for a period of 99 years. The SABL can be used as a basis for a sub-lease agreement between the ILG and a third party, for instance a company to develop and manage the land.¹

The scheme was incorporated in PNG's Land act in 1996. Originally the SABL was introduced to facilitate the development and harvesting of commercial crops such as cocoa, coffee, rubber and oil palm on customary land. SABLs were intended to provide certainty of land tenure for an agricultural investor, also allowing customary landowners to raise finance for an agricultural activity by using the lease as security. However, contrary to its original intention, the SABL scheme resulted in massive deforestation, especially after the introduction of the FCA in 2000, allowing companies to clear-fell forest areas (conditional on the agricultural development of the area). The ease with which FCAs could be attained facilitated the massive abuse of the SABL scheme.

Under the SABL scheme, Papua New Guinea has undergone a massive land rush between July 2003 and April 2011, during which 5.5 million hectares of customary land were leased to predominantly foreign-owned companies, representing around 12 percent of the country's total land mass and 16% of its commercially accessible forests. By 2012, logs cut under SABLs accounted for about one-third of PNG's exports of rainforest logs each year. In total, about 6.3 million cubic meters worth of timber from SABLs had been exported by the end of 2016.²

At minimum, 75 percent of the land under SABLs are now controlled by foreign-owned corporations (mostly Malaysian and Australian). A 2012 report from Greenpeace showed that this figure in practice to be even higher: a number of deals signed by landowner companies and ILGs use the addresses of logging companies when registering their companies with the PNG Investment Promotion Authority.³

¹ Filer C., 2012

² Global Witness, 2017

³ Greenpeace, 2012; Oakland Institute, 2013

Companies that acquired a sub-lease on forest land under SABL promised not only to develop large-scale agricultural development (oil palm production), but also to provide other benefits such as road infrastructure, health centres, and schools. However, because the companies' primary target is to extract the valuable timber, most of them delivered neither.¹

In March 2011, academics raised concerns over the rapid rise in the use of SABLs,² and whether landowners had given their free, prior and informed consent to these leases which alienated their land for 99 years. They argued that SABLs were being used to clear-fell forests on the pretext of carrying out agro-forestry projects. Due to these controversies, the PNG government established a Commission of Inquiry (COI), which held hearings between 2011 and 2012. The COI looked at the legality of 77 SABLs. However only two of the three appointed commissioners presented their final reports, covering 42 of the 77 leases investigated. In only 4 of the 42 SABLs assessed they found evidence of genuine landowner consent and commercially viable agricultural projects being undertaken. The Commission concluded most of the SABL leases were unlawful and recommended that they should be revoked.³ On 12 June 2014, the National Executive Council (NEC) confirmed that no further SABLs or FCAs should be issued, and approved action to revoke those SABLs that the Commission of Inquiry recommended should be revoked. However despite this NEC decision, it is reported that the defective SABLs and FCAs are yet to be cancelled and that logging is continuing to take place under them (GIZ 2016). Till date, only one lease has been cancelled and five have been revoked by the courts after they were challenged in lawsuits by customary landowners.⁴ Although the government has stopped granting new SABLs,⁵ they have continued to issue Forest Clearance Authorities: in 2016 and 2017, eight new FCAs described as agriculture projects appeared in PNG's timber export records. In recent years an unknown number of new FCA's have been issued directly to individual Incorporated Land Groups (ILGs) and/or Land Owner Companies (LOCs), who have gone into direct deals with companies for clear felling of the forest on their customary land, allegedly for agricultural or forest plantation establishment. In many cases there is no or hardly any sign of the agricultural or forest plantation development following the clear felling.⁶ This underlines that although the position of the government towards SABLs may change, the threat of large scale deforestation remains. As long as there are legal possibilities for these activities without proper Free Prior and Informed Consent, there remains a strong incentive for local people to establish a landholding group and enter into a contract with a (foreign) company. Long-term conservation and sustainable management of the forests can only be attained when

¹ Gabriel et al., 2017; Mirou, 2013; Nelson et al., 2014; Numapo, 2013 in Hambloch, 2018

² Filer C., 2011; Greenpeace, 2012

³ Global Witness, 2014

⁴ ActNow, 2015

⁵ NEC, 2014

⁶ Filer C., 2019

the community re-affirm their customary land rights , while at the same time the community together establishes a land use plan in which community conservation rules are embedded.

Although projects which are granted an FCA require approval on their ‘agro-forestry project’ proposal from the Department of Agriculture and Livestock (DAL), this does not mean that the these projects are financially viable or even that the areas are necessarily suitable for the agricultural land use proposed in these plans. For instance, the 4 Sigite-Mukus SABLs in the Pomio district of East New Britain, were clear-felled under the guise of establishing oil palm plantations, while the soils and terrain are considered not to be very suitable for oil palm (Nelson et al., 2014; Hambloch, 2018). Also infrastructure and market accessibility are often an issue. Although the SABL scheme was intended for agricultural development, the main interest of the companies is the timber. Past forest clearing operations in SABLs, such as for the Turubu SABL in East Sepik Province, have demonstrated as such, as many operating companies made little to no effort to establish actual plantations after clearing and shipping off all the timber (CEPA, 2019).

3.4.2 The Baseline Scenario for the Tavolo Project Area

The clans of the Tavolo Community in East New Britain Province hold the customary land rights over the total area of 21,782 ha, out of which 84% is classified as forest cover in the PNGFA Forest Basemap 2012.

The Tavolo Project Area is currently under the Mukus-Melkoi SABL over a total area of 68,300 ha which was issued in August 2008 to a landowner company called RERA Holdings Ltd (RHL) for a period of 99 years. This has been done without the FPIC from the Tavolo Community whom hold the customary rights over a large part of the land covered by the SABL (see maps in section 3.3.1).

Upon invitation by RHL a company called Double Dynasty Lumber Ltd (DDLL)¹ developed a project proposal (Annex 2) to clear fell and establish 45,000 ha of oil palm plantation in the SABL under the name of ‘Mukus-Melkoi Large Scale Integrated Agriculture Project’. Based on their project proposal DDLL was able to secure a Forest Clearing Authority (FCA) in October 2010, which is valid for 17 years.

In February 2012, the Commission of Inquiry (COI) also investigated the Mukus-Melkoi SABL.² Although the hearing transcripts already indicate that the COI found substantial shortcomings, the final COI report on the SABLs of East New Britain was never submitted to the PNG

¹ DDLL is a subsidiary of Brilliant Investment Ltd, which was able to secure an SABL (in 2007) and an FCA (in 2009) for the Angoram (Marienberg) Integrated Agriculture Project in East Sepik Province (see Table 7.3), and then proceeded to harvest and export about 340,000 cubic meters of logs from that area between 2010 and 2013. (McDonnell et al. 2017)

² The transcript of proceedings can be found here:
https://www.oaklandinstitute.org/sites/oaklandinstitute.org/files/CoI_SABL_KIMBE_10_February_2012.pdf

Government by the Commissioner. Also the files on the Mukus-Melkoi SABL with the Department of Lands and Physical Planning are claimed to have been lost/misplaced.¹ There has been an investigation done on all SABLs not reported on by the COI, by the Lands Department Ministerial SABL Investigation Committee, which is said to have completed its work, but to date no official statement or recommendation has been made that the Mukus-Melkoi SABL is unlawful and should be or will be revoked.

According to the Chairperson of the Kakuna-Lote Resource Development Limited (KLRDL) LOC, they bought the lease from Rera Holdings in October 2019 for PGK350,000, and signed a MOU with Mekar (PNG) Limited, a subsidiary of Vanimo Jaya Ltd² for them to operate the Kakuna-Lote Agro-Forestry & Reforestation Plantation Development Project (to be called the Kakuna-Lote plantation project).

According to the Kakuna-Lote Plantation Project proposal, KLRDL was incorporated on 4 September 2018 as a LOC of one Incorporated Land Group (ILG), the Litupupuna Land Group, comprising of 5 clans; Chamoso, Awila, Kietuna, Una and Valiangata. However, the Kakuna-Lote Plantation Project's proposal annexes show two different ILG certificates, of Awila ILG and Kipolo ILG. There is no copy of a Litupupuna ILG certificate, KLRDL is owned by its Board Chairman Felix Akai and its Managing Director Alois Nausei, who each hold 100 shares.

As part of the application for a new FCA, a so-called "public hearing" on the proposed project was organised by the Department of Agriculture & Livestock (DAL), the Kakuna-Lote LOC and Vanimo Jaya in September in Kokopo, the East New Britain Provincial capital. This public hearing was supposed to be held within the project area, to determine if there is FPIC for the project with each of the clans whose land is included in the project area. Only a small number of landowners attended this public hearing, and the community of Tavolo was only informed about the hearing after it took place.

The East New Britain Provincial Forest Management Committee (ENB PFMC) approved the Kakuna-Lote FCA application in its meeting of 20 December 2019, but ordered a number of "corrections" to take place, a/o holding public hearings within the project area to confirm the FPIC of the landowning clans.

Till August 2019 Vanimo Jaya was actively logging in two timber rights purchasing agreements in the Open Bay area, Lasul, East New Britain. In a lawsuit against Vanimo Jaya, after finding that the timber purchasing permits under which it operated were illegally granted extension, PNG's National Court has ordered to cease its logging operations in this area and leave within 28 days.

¹Verbal communication with Chairman of the Lands Department Ministerial SABL Investigation Committee, confirmed by separate communications with 2 members of the Committee, and by investigations with Land Dpt by lawyer John Sirigoi on 2 occasions

²Vanimo Jaya's past operations were mainly in forest concessions. They were responsible for 7.6% of PNG's total timber exports in 2018 (SGS, 2019), 9.7% in 2017 (SGS, 2018) and 7.7% in 2016 (SGS, 2017)

It is feared that Vanimo Jaya will move quickly and transfer their machinery to the Mukus-Melkoi SABL, now they have obtained the sublease.

Additionally, (vast) deforestation activities between 2011 and 2018 (>22,000 ha) and the development of oil palm plantations in the Sigite-Mukus SABLs in the Pomio district (adjacent to the Tavolo Project Area) by another logging company (GilfordLtd, part of Rimbunan Hijau) have made the area more accessible for further deforestation in neighbouring areas. It is therefore expected that in the baseline scenario similar deforestation and palm oil plantation activities will take place within the near future.

The Kakuna-Lote LOC and Vanimo Jaya are now moving forward with their deforestation plans for the Mukus-Melkoi SABL Area. In June 2019 the Kakuna-Lote LOC in cooperation with Mekar (PNG) Ltd (a subsidiary of Vanimo Jaya) presented a FCA project proposal under the name of Kakuna-Lote Agro Forestry & Reforestation Plantation Development Project. The FCA project proposal (in Annex 3) states that 45,980 ha out of the total 64,180 ha of Mukus-Melkoi is planned to be deforested in a time span of 8 years, starting in 2019/2020.¹ Furthermore the project plan indicates that 32% (16,800 ha) of the deforested area will be converted into Eucalyptus plantations, and another 4% (1,800 ha) into Cocoa/Coffee plantations.²

The scope for this Tavolo REDD Project is limited to the Tavolo Community, and does not cover the other communities within the Mukus-Melkoi SABL. This is because FORCERT has not yet established partnership relations with other communities in the area, although recently some interest has been shown by other communities to start work with FORCERT.

The PNG Communities BEST, of which the Tavolo Community Conservation Association will be the first member, works with communities who have already shown a strong interest and commitment to sustainable management of their land and resources. This means these communities will have undertaken a High Conservation Values assessment, and have started their participatory community sustainable land use planning process, which will result in an agreed sustainable land use plan and community conservation laws. This is the foundation for strong commitment and ownership by the community on sustainable land and resource use and on nature conservation for their land and waters based on the essential local ecosystem services or environmental benefits they receive from nature. Only once this foundation is clearly laid, potential monetary benefits from environmental services provided by third parties will be considered and discussed with the community, This preparation process allows a selection of committed communities and avoids an influx of community leaders that are mainly lured by potential monetary benefits, lacking the underlying conservation commitments by the whole community, needed to ensure permanence for the building of the PNG Communities BEST membership and its long-term income generating efforts.

¹Kakuna-Lote FCA Project proposal, June 2019, section 4.2.4 and attached map with Kakuna-Lote harvesting plan

²Kakuna-Lote FCA Project proposal, June 2019, section 4.4

3.5 Additionality

Following the instructions given in VM0007 REDD methodology, the CDM methodological tool “Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities” (T-ADD) is used to identify credible alternative land use scenarios and evaluate both the alternatives and the proposed project scenarios and to demonstrate the additionality of the project. The result of this analysis is presented in the different steps below.

3.5.1 Identification of alternative land use scenarios to the proposed REDD project activity

Alternative land use scenarios		Consistency with enforced mandatory applicable laws and regulations	Plausibility
Alternative 1	Large scale agricultural project: Forest is clear-cut by the SABL sublease holder and a large scale agricultural project is established, before the national government declares the SABL and its corresponding FCA null and void.	(Consistent) As described in section 3.4.1, the legality of the SABL is under scrutiny and no new SABLs are being granted. Past government statements have indicated that many of the existing SABLs (and their underlying FCAs) may become void and nullified in the future. However, till date, the government is reluctant to act. In contrast, new FCAs are still being handed out. Additionally, it is unclear if the already issued FCA under the Mukus-Melkoi SABL is formally still valid, while a new FCA application has already been approved by the ENB PFMC granted to a new company & project developer, Lote-Kakuna LOC and Mekar Ltd.	(Most plausible scenario) Considering the recent clear-cutting activities in the adjacent Sigite-Mukus SABLs areas and the ongoing postponement of the decision to revoke the SABLs, it can be expected that the forest will be cleared in the near future. The expectancy that the SABLs will be cancelled in the future even adds pressure on the deforestation agents to rapidly start logging. As the adjacent areas, covered by the Sigite-Mukus SABLs, are being converted to large-scale oil-palm plantations, it is expected that the same would happen in the project area.
	Deforested degraded fallow land: Forest is clear-cut by the SABL sublease holder and the land is abandoned, before the national government declares the SABL and its corresponding FCA null and void. The deforested land may	(Consistent) Same as Alternative 1	Comparable to the above, but less plausible , because the premise of the SABL is the development of a large scale agricultural project. Also oil-palm plantations are being developed in the adjacent deforested Sigite-Mukus SABL.

Alternative land use scenarios		Consistency with enforced mandatory applicable laws and regulations	Plausibility
	develop in secondary forest over time.		
Alternative 3	Subsistence agriculture: Forest is (partially) cleared by the community for subsistence farming, while the SABL is still in place.	(Inconsistent) As described above the SABL is formally still valid, even though it has been deemed fraudulent by the Commission of Inquiry. So as the situation is now, officially the communities have no rights over their land as it state land, and would officially need to get permission from the sublease holder for any clearance of forest to establish subsistence agriculture.	(Not plausible) Apart from the fact that it is inconsistent with the applicable laws, the community has zoned these project areas into natural forest, conservation and sustainably managed production forest in their land use management plans, and are abiding by these plans.
Alternative 4	SABL and FCA are cancelled as a result of a lawsuit by the Tavolo Community which could result in: a) Forest remains forest, or; b) Forest is (partially) cleared by the community for subsistence farming	(Consistent) After cancellation of the SABL and the FCA, the communities again would have the land rights.	(Less plausible) The community alone has insufficient financial resources to pay for the lawsuit. Also, the threat of a new company obtaining a permit to clear the forest remains, while land has no formal (community) conservation status. a) Although the Tavolo Community is committed to conserve the forest it will be very difficult for them to maintain this on the long-term without financial resources b) The community has zoned the project areas into conservation and sustainably managed production forests in their land use management plans and are abiding by these plans.
Alternative 5	SABL and FCA are nullified (in time) by the government of PNG which could result in a) Forest remains	(Consistent) Same as Alternative 4.	(Less plausible) The decision to nullify all illegal SABLs was already made in 2013 and the government has been reluctant to implement

Alternative land use scenarios		Consistency with enforced mandatory applicable laws and regulations	Plausibility
	forest, or; b) Forest partly cleared by the community for subsistence farming		this decision. Only through court actions have some of the SABLs been cancelled. a) Same as alternative 4a b) same as alternative 4b
Alternative 6	Forest remains forest: Forest is not logged by the SABL sublease holder due to low profit and high investment costs.	(Consistent) Same as Alternative 1 and 2	(Not plausible) As logging and wood export trends indicate the logging business in PNG is ever increasing, making PNG currently the largest exporter of round logs in the world. Also the past large scale operations by the same agent in the adjacent areas indicates the willingness of the company to harvest the trees and establish plantations.

3.5.2 Investment Analysis

Although the benefits that the communities receive from conserving their forest are manifold - such as food, building materials, medicines and other forest products (mainly for subsistence), regulating services (water regulation), cultural/spiritual values- they are mostly non-monetary. As many traditional communities in Papua New Guinea, the Tavolo Community is very much aware of the value of the forest and the importance to conserve it, not only for their own well-being, but also for future generations. However, naturally they also want to develop and improve their standard of living.

The difference in (short-term) financial gain between conserving a forest or clearing it for timber is big. First of all a direct benefit for the landowners within the whole area under the Mukus-Melkoi SABL of around 30M PGK is projected by the project developer in the form of landowner royalties, LOC premiums and development levies.¹ Additional to this cash payment, logging and large-scale agricultural companies promise “development” through establishment of roads and bridges, schools, health clinics, water supply (tanks), and paid jobs.

This means that without the revenue from the sale of carbon credits providing long term guarantee annual benefits, people will remain tempted to choose for quick gains.

¹Kakuna-Lote FCA Project proposal, June 2019, attachment 4

A crucial part of the project will be the establishment of a Payment for Ecosystem Services (PES) trust (see section 1.11.3), called the PNG Communities Benefits from Environmental Services Trust (PNG Communities BEST), that will facilitate structured and transparent benefit distribution of revenues from carbon credits sales to the community to finance the priority needs as identified by the Tavolo Community.

3.5.3 Barrier analysis

There is a substantial barrier related to the governance. Due to the uncertainty whether or not the SABLs will be nullified by the PNG government, the sublease holder of the Mukus-Melkoi SABL is encouraged to operate quickly and cut the forests before the government reaches a decision and acts on it. On the other hand it is very uncertain when the government of PNG will implement their decision on the nullification of the SABLs, or even if they will implement it at all. Therefore there is a need for immediate upfront investment to force a court decision to declare the SABL illegal. This barrier does not prevent (even encourages) alternatives 1 and 2.

Protection of the forests in Tavolo requires significant funding. First of all the lawsuit to cancel the SABL requires significant upfront investment. All previous SABLs that have been cancelled as a result from lawsuits, have been dependent on outside donor support, often combined with pro-bono efforts of lawyers originating from or related to the SABL area (the Tavolo Community is not so fortunate to have a lawyer among its members). Also there are costs for formalizing the forest area under a protection status. But these funds are scarce and difficult to obtain by local communities without significant operational and administrative support. The landowning communities in the neighbouring West Pomio SABL areas have experienced serious disruptions and delays in their court case against this SABL due to the lack of funds to meet legal fees. Secondly, the communities need to have income to achieve needed and/or aspired development in their community, e.g. school buildings, health clinic, permanent houses, community hall, church building, solar or hydro power, water supply, money for school fees and visits to town hospitals. Thirdly, they need to develop alternative sustainable livelihood options that will allow them to secure the long term income that will allow them to guarantee adherence to their sustainable land use plan and forest protection activities in the long run. This barrier does not prevent alternatives 1, 2, 3, 5b and 6. Alternative 5a would also not be (immediately) prevented by lack of funding, however in the long term, to ensure protection of the forests, funding is expected to be a requirement.

3.5.4 Common practice analysis

It is not common practice for local communities in PNG to protect forest for financial return, in the absence of carbon finance. Regarding the recent legal actions by local land owners that have thus far successfully halted 4 SABL contracts, the goal of these communities was to regain their land rights, not necessarily to establish a protected forest area. As described above, through their collaboration with FORCERT, Tavolo was also identified by the national government as one of the pilot sites for the development and field testing of a national REDD/PES payment

distribution system. This project can therefore be considered a pioneering community managed REDD+ project PNG and thus not as common practice.

3.5.5 Conclusion

Based on the above analysis we conclude that the project can be considered **additional** and we consider Alternative 1 as the most plausible Baseline Scenario.

3.6 Methodology Deviations

No methodology deviations are made.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

For the estimation of baseline carbon stock changes and greenhouse gas emissions from the planned deforestation under the FCA, the VCS module VMD0006 “Estimation of baseline carbon stock changes and greenhouse gas emissions from planned deforestation and planned degradation (BL-PL)” is used.

The VMD0006 module prescribes that the baseline net GHG emissions for planned deforestation will be determined as:

$$\Delta C_{BSL,planned} = \sum_{t=1}^{t^*} \sum_{i=1}^M (\Delta C_{BSL,i,t} + GHG_{BSL,E,i,t}) \quad (1)$$

Where:

$\Delta C_{BSL,planned}$	Net GHG emissions in the baseline from planned deforestation; tCO ₂ e
$\Delta C_{BSL,i,t}$	Net carbon stock changes in all pools in the baseline stratum i at time t ; tCO ₂ e
$GHG_{BSL,E,i,t}$	Greenhouse gas emissions as a result of deforestation activities within the project boundary in the baseline stratum i during project year t ; tCO ₂ e year ⁻¹
i	1, 2, 3, ... M strata
t	1, 2, 3, ... t^* years elapsed since the projected start of the REDD project activity

This quantification of the baseline emissions is done through the following three steps:

1. Calculation of annual area of land deforested
2. Calculation carbon stock change in the baseline

3. Calculation greenhouse gas emissions in the baseline

4.1.1 Step 1 - Calculation of annual area of land deforested

The annual area of deforestation in the baseline is calculated as follows:

$$AA_{planned,i,t} = (A_{planned,i} * D\%_{planned,i,t}) * L - D_i \quad (2)$$

Where:

$AA_{planned,i,t}$ Annual area of baseline planned deforestation for stratum i at time t ; ha

$D\%_{planned,i,t}$ Projected annual proportion of land that will be deforested in stratum i during year t ; %

$A_{planned,i}$ Total area of planned deforestation over the baseline period for stratum i ; ha

$L - D_i$ Likelihood of deforestation for stratum i ; %

As described in the baseline scenario (section 3.4.2) the Tavolo Project Area is situated under the Mukus-Melkoi SABL which is currently granted to the Kakuna-Lote LOC. Therefore the agent of planned deforestation in the Tavolo Project Area is the Kakuna-Lote LOC.

For the Mukus-Melkoi SABL, with a total area of 68,300 ha, the Kakuna-Lote LOC developed a FCA Project proposal, under the name of 'of Kakuna-Lote Agro Forestry & Reforestation Plantation Development Project', which presents a plan to clear fell 45,980 ha of forest and to convert it into other land uses (section 4.2.4 of the Kakuna-Lote FCA proposal). Figure 9 presents a digitized representation of the map with the plan of deforestation which is attached to the Kakuna-Lote Project proposal (original map attached as Annex4). As can be seen, the clear felling of the 45,980 will take place in 8 blocks over a time span of 8 years, ranging from PY01 (year 1) to PY08 (year 8). The first block to be deforested (block PY01, year 1) is located in the south-west corner of the SABL, inside the Tavolo Project Area. According to the Kakuna-Lote plan, presented in the map, the forest inside the Tavolo Project Area will be cleared in the first 5 year.

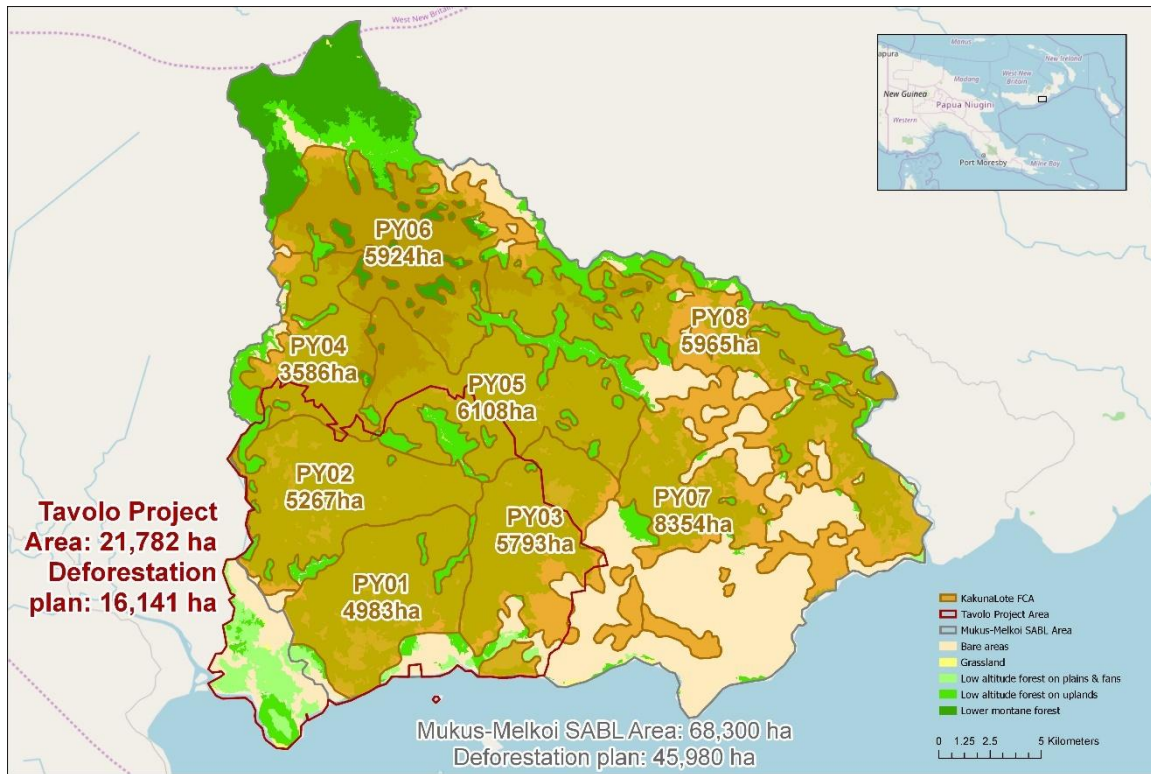


Figure 9 - Plan of Deforestation as presented by Kakuna-Lote LOC in their FCA Project proposal

Based on the deforestation plan by Kakuna-Lote LOC in the Mukus-Melkoi SABL, as presented in section 3.4.2, it is found that for the Tavolo Project Area the total area of planned deforestation over the baseline period $A_{planned, i}$ is 16,141 ha out of the 21,782 ha.

Since Kakuna-Lote LOC proposes to clear fell one block per year, the annual deforestation rate $D\%_{planned, i, t}$ for each individual block is different as presented in Table 3.

Since the area under the Mukus-Melkoi SABL is not under government control nor under the control of the original customary landowning clans (the Kakuna-Lote LOC owns the 99 year State Lease over the total area under the SABL), the likelihood of deforestation $L - D_i$ is set to 100%.

Thus the total area of planned deforestation over the baseline period for the Tavolo Project Area is:

$$A_{planned, i} = 16,141 \text{ ha}$$

And the annual area of deforestation in the first year of the baseline scenario is:

$$AA_{planned, i, t} = (A_{planned, i} * D\%_{planned, i, t}) * L - D_i = (16,141 * 30.9\%) * 100\% = 4,982 \text{ ha}$$

This calculation is repeated for the other blocks of deforestation. The result is presented in the Table 3 below:

Table 3 - Kakuna-Lote Deforestation plan for the Tavolo Project Area

Block	Annual deforestation rate (%)	Annual deforestation area inside Tavolo Project Area (ha)
i, t	$D\%_{planned,i,t}$	$AA_{planned,i,t}$
PY01	30.9%	4,982
PY02	32.5%	5,245
PY03	25.1%	4,045
PY04	3.0%	490
PY05	8.5%	1,379
Total area of planned deforestation (ha)		16,141
$A_{planned,i}$		

4.1.2 Step 2 - Calculation carbon stock change in the baseline

The net carbon stock changes in the baseline is equal to the baseline pre-deforestation stock minus the long-term carbon stock after deforestation and minus the baseline stock that enters the wood products pool at the time of deforestation (i.e. not emitted from aboveground biomass at the time of deforestation).

The carbon pools included for this project (see section 3.3.2) are the aboveground tree biomass, the belowground tree biomass and the harvested wood products.

Above- and belowground tree biomass pools

Carbon stock changes in the aboveground tree biomass (AGB) and belowground tree biomass (BGB) pools are calculated by subtracting post-deforestation carbon stocks from pre-deforestation forest carbon stocks in the baseline:

$$\Delta C_{ABtree,i} = C_{ABtree_{bsl},i} - C_{ABtree_{post},i} \quad (3)$$

$$\Delta C_{BBtree,i} = C_{BBtree_{bsl},i} - C_{BBtree_{post},i} \quad (4)$$

Where:

$\Delta C_{ABtree,i}$ Baseline carbon stock change in aboveground tree biomass in stratum i ; tCO₂e ha⁻¹

$C_{ABtree_{bsl},i}$ Forest carbon stock in aboveground tree biomass in stratum i ; tCO₂e ha⁻¹

$C_{ABtree\ post,i}$	Post-deforestation carbon stock in aboveground tree biomass in stratum i ; tCO ₂ e ha ⁻¹
$\Delta C_{BBtree,i}$	Baseline carbon stock change in belowground tree biomass in stratum i ; tCO ₂ e ha ⁻¹
$C_{BBtree\ bsl,i}$	Forest carbon stock in belowground tree biomass in stratum i ; tCO ₂ e ha ⁻¹
$C_{BBtree\ post,i}$	Post-deforestation carbon stock in belowground tree biomass in stratum i ; tCO ₂ e ha ⁻¹
<i>Post-deforestation carbon stock</i>	

To estimate the pre-deforestation carbon stocks in above- and belowground tree biomass in the Tavolo Project Area, a forest inventory was carried out by FORCERT and the Tavolo community between September and November 2020. During this forest inventory tree biomass was measured on 72 different sample plots distributed over the Tavolo Project Area. The sample plots were installed in the project area according to a stratified sampling design (see Figure 10). Following PNG's National Forest Inventory (NFI)¹, the sample plots are grouped together in a cluster of four plots, and the location of these clusters were determined using a regular grid. In order to avoid inaccessible terrain, clusters located in steep areas (>20 degrees) are excluded from the forest inventory. The operating procedure followed during this inventory is described in Annex5.



Figure 10 - Map with the locations of the sample plots of the baseline carbon inventory conducted in 2020

To improve the accuracy and precision of baseline carbon stock assessment, the forest stratification as presented in Papua New Guinea's National REDD+ Forest Reference Level (PNG's FREL) is used.² Within the Tavolo Project area 2 different forest strata are present, namely: "Low altitude forest on plains & fans" and "Low altitude forest on uplands". The delineation of the forest strata in the Project Area are shown in Figure 10 above.

¹ PNGFA 2018, NFI Information Booklet, 3rd Edition

² Papua New Guinea's National REDD+ Forest Reference Level; Modified Submission for UNFCCC Technical Assessment in 2017

Based on the measured tree diameter's (DBH) and tree heights (H) on the sample plots, the aboveground tree biomass is calculated for each tree using the allometric equations and wood density values provided in the ACIAR database for tree species in PNG.¹The mean Belowground tree biomass (BGB) is subsequently calculated using the default root-shoot ratio's provided PNG's FREL. For both forest strata present in the project area, the root-shoot ratio is 0.37.²For the calculation of the carbon content in the whole tree biomass, the default carbon fraction (CF) for PNG of 0.47 tC t⁻¹ dry matter is used as given in PNG's FREL and the IPCC 2006 Guidelines.³ Furthermore 44/12 is used as the standard ratio molecular weight of CO₂ to carbon (CO₂F).

The results of the 2020 baseline (pre-deforestation) forest carbon stock inventory are presented for the different strata in the Table 4 below.

Table 4 - Results of the 2020 baseline assessment of the above ground tree biomass in different forest strata in the Tavolo Project Area

Forest stratum	Area (ha)	No. Plots in 2020 (n)	$C_{ABtree\ bsl}$ (tCO ₂ e ha ⁻¹)	$C_{BBtree\ bsl}$ (tC O ₂ e ha ⁻¹)	$C_{ABtree\ bsl} + C_{BBtree\ bsl}$ (tC O ₂ e ha ⁻¹)	Uncertainty (at 95% CL)
Low altitude forest on plains & fans	1,171 ha	8 plots	501.7	185.6	687.3	45.0%
Low altitude forest on uplands	13,297 ha	48 plots	410.2	151.8	562.0	17.2%
Total results (combined strata)	14,468 ha	56 plots	417.6	154.5	572.1	16.1%

Post-deforestation carbon stock

As for the post-deforestation carbon stock a combination of land uses are proposed by the project developer in the baseline: 32% will be converted into forest plantations (Eucalyptus), another 4% will be converted into Cocoa/Coffee plantations, and the remaining 64% will probably turn into subsistence agriculture and other land uses, with plans also indicated for cattle farming. The IPCC Guidelines 2006 and PNG's FREL provides default carbon stocks for the different land uses, these are presented in the Table 5 below. Based on these defaults a mean post-deforestation carbon stock in AGB is calculated at **111.7 tCO₂e ha⁻¹** and the carbon stock in BGB at **41.3 tCO₂e ha⁻¹**.

¹ ACIAR database PNG: Fox, J. C., Yosi, C. K., Nimiago, P., Oavika, F., Pokana, J. N., Lavong, K., and Kennan, R. J. (2010). Assessment of aboveground carbon in primary and selectively harvested tropical forest in Papua New Guinea. Biotropica 42, 410–419

² Papua New Guinea's National REDD+ Forest Reference Level; Modified Submission for UNFCCC Technical Assessment in 2017 – Table 6.2

³ 2006 IPCC Guidelines for National Greenhouse Gas Inventories – Chapter 4 – Table 4.3

Table 5 - Calculation of the mean post-deforestation C-stock in the Tavolo Project Area

Landuse	Area (%)	$C_{ABtree_{post}}$ (tCO ₂ e ha ⁻¹)	Root-Shoot factor	$C_{BBtree_{post}}$ (tCO ₂ e ha ⁻¹)	Reference
Cocoa plantation	4%	199.9	37%	74.0	Table 5.3, IPCC 2006
Forest plantation	32%	168.9	37%	62.5	Table 6.2 PNG FREL
Subsistence & other land use	64%	77.6	37%	28.7	Table 6.3 PNG FREL, Table 5.1, IPCC 2007
Mean post-deforestation C-stock	100 %	111.7	37%	41.3	

Thus, based on the mean values given by PNG's FREL, the baseline carbon stock change in aboveground tree biomass for the two different forest strata area calculated as:

$$\Delta C_{ABtree,i} = C_{ABtree_{bsl},i} - C_{ABtree_{post},i} = 417.6 - 111.7 = 305.9 \text{ tCO}_2\text{e ha}^{-1}$$

When the root-shoot ratio (RS) of 0.37 is applied, the baseline carbon stock change in belowground tree biomass for the two different forest strata is calculated as:

$$\Delta C_{BBtree,i} = C_{BBtree_{bsl},i} - C_{BBtree_{post},i} = 154.5 - 41.3 = 113.2 \text{ tCO}_2\text{e ha}^{-1}$$

Harvested wood products pool

To calculate the carbon stocks in the wood products resulting from timber harvest occurring prior to, or in the process of deforestation, the VCS module VMD0005 is followed for the estimation of carbon stocks in the long-term wood products pool¹:

First the biomass carbon entering the wood products pool at the time of deforestation is calculated as:

$$C_{WP,i} = C_{XB,i} * (1 - WWty) \quad (5)$$

Where:

$C_{WP,i}$ Carbon stock entering the wood products pool at the time of deforestation from stratum i ; tCO₂e ha⁻¹

$C_{XB,i}$ Mean stock of extracted biomass carbon at the time of deforestation from stratum i ; tCO₂e ha⁻¹

¹VMD0005 Estimation of carbon stocks in the long-term wood products pool (CP-W), v1.1

WW_{ty}	Wood waste. The fraction immediately emitted through mill inefficiency by class of wood product ty ; dimensionless
ty	Wood product class – defined here as sawnwood (s), wood-based panels (w), other industrial roundwood (oir), paper and paper board (p), and other (o)
i	1, 2, 3, ... M strata

Then the amount of wood products entering the pool at the time of deforestation that is expected to be emitted over a 100-year timeframe is calculated as follows:

$$C_{WP100,i} = C_{WP,i} - C_{WP,i} * (1 - SLF_{ty}) * (1 - OF_{ty}) \quad (6)$$

Where:

$C_{WP100,i}$	Carbon stock entering the wood products pool at the time of deforestation that is expected to be emitted over 100-years from stratum i ; tCO _{2e} ha ⁻¹
$C_{WP,i}$	Mean stock of extracted biomass carbon by class of wood product ty from stratum i ; tCO _{2e} ha ⁻¹
SLF_{ty}	Fraction of wood products that will be emitted to the atmosphere within 5 years of timber harvest by class of wood product ty ; dimensionless
OF_{ty}	Fraction of wood products that will be emitted to the atmosphere between 5 and 100 years of timber harvest by class of wood product ty ; dimensionless
ty	Wood product class – defined here as sawnwood (s), wood-based panels (w), other industrial roundwood (oir), paper and paper board (p), and other (o)
i	1, 2, 3, ... M strata

In its project proposal the Kakuna-Lote LOC projects a mean salvageable timber volume of 48.274 m³ ha⁻¹. This volume is converted into a mean stock of extracted biomass carbon of 13.4 tCO_{2e} ha⁻¹. For this conversion the default factors for tropical timber species are used as provided by the IPCC 2006 Guidelines¹. For tropical tree species the default wood density is 0.59 t oven-dry timber per m³ solid wood product. The default carbon fraction used is 0.47 tC per t oven-dry timber as given in PNG's FREL.

As a next step the carbon stock entering the wood products pool at the time of deforestation is calculated using the default factor for wood waste of 0.24 as given by VCS module VMD0005 for developing countries:

¹ 2006 IPCC Guidelines for National Greenhouse Gas Inventories - Chapter 12: Harvested Wood Products

$$C_{WP,i} = C_{XB,i} * (1 - WWty) = 13.4 * (1 - 0.24) = 10.2 \text{ tCO}_2\text{e ha}^{-1}$$

Following VCS Module VMD0005, the carbon stock entering the wood products pool at the time of deforestation that is expected to be emitted over 100-years is calculated using the default fraction parameters for roundwood:

$$C_{WP100,i} = C_{WP,i} - C_{WP,i} * (1 - SLfty) * (1 - OFty) = 10.2 - 10.2 * (1 - 0.3) * (1 - 0.7) =$$

$$8.0 \text{ tCO}_2\text{e ha}^{-1}$$

This carbon stock in the wood products pool will be emitted at an annual rate of 1/20 of the stock for 20 years.

Sum of baseline carbon stock change in all pools

Stock changes in the aboveground tree biomass are emitted at the time of deforestation. Following deforestation, emissions from belowground biomass are emitted at an annual rate of 1/10 of the stock change for 10 years. Carbon stocks entering the wood products pool at the time of deforestation, and that are expected to be emitted over 100-years, are emitted at an annual rate of 1/20 of the stock for 20 years. Thus for a given year t , emissions are summed across areas deforested from time $t-10$ up to time t (for belowground biomass) and from time $t-20$ up to time t (for wood products), in equation below:

$$\begin{aligned} \Delta C_{BSL,i,t} = & AA_{planned,i,t} * (\Delta C_{ABtree,i} - C_{WP100,i}) \\ & + \sum_{t-10}^t \left(AA_{planned,i,t} * (\Delta C_{BBtree,i}) * \frac{1}{10} \right) \\ & + \sum_{t-20}^t \left(AA_{planned,i,t} * (C_{WP100,i}) * \frac{1}{20} \right) \end{aligned} \quad (7)$$

Where:

$\Delta C_{BSL,i,t}$	Sum of the baseline carbon stock change in all pools in stratum i at time t ; tCO ₂ e
$AA_{planned,i,t}$	Annual area of baseline planned deforestation for stratum i at time t ; ha
$\Delta C_{ABtree,i}$	Baseline carbon stock change in aboveground tree biomass in stratum i ; tCO ₂ e ha ⁻¹
$\Delta C_{BBtree,i}$	Baseline carbon stock change in belowground tree biomass in stratum i ; tCO ₂ e ha ⁻¹

$C_{WP100,i}$ Carbon stock entering the wood products pool at the time of deforestation that is expected to be emitted over 100-years from stratum i ; tCO_{2e} ha⁻¹

i 1, 2, 3, ... M strata

t 1, 2, 3, ... t years elapsed since the projected start of the REDD project activity

Summing the different carbon pools given above, the carbon stock change in the baseline for the Tavolo Project Area is calculated for the first year as:

$$\Delta C_{BSL,i,t} = AA_{planned,i,t} * (\Delta C_{ABtree,i} - C_{WP100,i}) + \sum_{t-10}^t (AA_{planned,i,t} * (\Delta C_{BBtree,i}) * \frac{1}{10}) + \sum_{t-20}^t (AA_{planned,i,t} * (C_{WP100,i}) * \frac{1}{20}) =$$

$$4,982 * (322.5 - 8.0) + (4,982 * (119.3 * 0.1)) + (4,982 * (8.0 * 0.05)) = \mathbf{1,628,165 \text{ tCO}_2\text{e}}$$

And for the second year as:

$$5,245 * (322.5 - 8.0) + (10,227 * (119.3 * 0.1)) + (10,227 * (8.0 * 0.05)) = \mathbf{1,775,568 \text{ tCO}_2\text{e}}$$

The baseline carbon stock changes for all the 30 years of the project period are given in Table 6 below.

Table 6 - Stock change in the baseline carbon pools

Year	Annual deforestation in open forest (ha)	Stock change in AGB (tCO _{2e})	Stock change in BGB (tCO _{2e})	Stock change in HWP (tCO _{2e})	Sum of stock change in all baseline carbon pools (tCO _{2e})
Year 1	4,982	1,524,215	56,396	2,002	1,542,571
Year 2	5,245	1,604,678	115,769	4,110	1,682,401
Year 3	4,045	1,237,545	161,558	5,735	1,372,328
Year 4	196	60,023	163,779	5,814	228,040
Year 5	-	-	163,779	5,814	169,593
Year 6	-	-	163,779	5,814	169,593
Year 7	-	-	163,779	5,814	169,593
Year 8	-	-	163,779	5,814	169,593
Year 9	-	-	163,779	5,814	169,593
Year 10	-	-	163,779	5,814	169,593
Year 11	-	-	107,383	5,814	113,197
Year 12	-	-	48,010	5,814	53,824

Year 13	-	-	2,221	5,814	8,035
Year 14	-	-	-	5,814	5,814
Year 15	-	-	-	5,814	5,814
Year 16	-	-	-	5,814	5,814
Year 17	-	-	-	5,814	5,814
Year 18	-	-	-	5,814	5,814
Year 19	-	-	-	5,814	5,814
Year 20	-	-	-	5,814	5,814
Year 21	-	-	-	3,812	3,812
Year 22	-	-	-	1,704	1,704
Year 23	-	-	-	79	79
Year 24	-	-	-	-	-
Year 25	-	-	-	-	-
Year 26	-	-	-	-	-
Year 27	-	-	-	-	-
Year 28	-	-	-	-	-
Year 29	-	-	-	-	-
Year 30	-	-	-	-	-
Total	14,468	4,426,462	1,637,791	116,286	6,064,253

4.1.3 Step 3 - Calculation greenhouse gas emissions in the baseline

The GHG emissions in the baseline within the project boundary is estimated as:

$$GHG_{BSL,E,i,t} = E_{FC,i,t} + E_{BiomassBurn,i,t} + N_2O_{direct-N,i,t} \quad (8)$$

Where:

$GHG_{BSL,E,i,t}$ Greenhouse gas emissions as a result of deforestation activities within the project boundary in the stratum i in year t ; tCO₂e

$E_{FC,i,t}$ Emission from fossil fuel combustion in stratum i in year t ; tCO₂e

$E_{BiomassBurn,i,t}$ Non-CO₂ emissions due to biomass burning in stratum i in year t ; tCO₂e

$N_2O_{direct-N,i,t}$	Direct N ₂ O emission as a result of nitrogen application on the alternative land use within the project boundary in stratum i in year t ; tCO ₂ e
i	1, 2, 3, ... M strata
t	1, 2, 3, ... t years elapsed since the projected start of the REDD project activity

The GHG emissions as a result of deforestation activities in the Tavolo Project Area are conservatively set to **0 tCO₂e** for all years.

4.2 Project Emissions

For estimating ex-ante net carbon stock changes and GHG emissions in the project scenario VCS module VMD0015 is followed.¹

For the project area the net greenhouse gas emissions in the project scenario is equal to the sum of stock changes due to deforestation and degradation plus the total greenhouse gas emissions minus any eligible forest carbon stock enhancement:

$$\Delta C_{PRJ} = \sum_{t=1}^{t^*} \sum_{i=1}^M (\Delta C_{PRJ,DefPA,i,t} + \Delta C_{PRJ,Deg-IT,i,t} + \Delta C_{PRJ,Deg-FSC,i,t} + \Delta C_{PRJ,DistPA,i,t} + \Delta GHG_{PRJ-E,i,t} - \Delta C_{PRJ,Enh,i,t}) \quad (9)$$

Where:

ΔC_{PRJ}	Net greenhouse gas emissions within the project area under the project scenario; tCO ₂ e
$\Delta C_{PRJ,DefPA,i,t}$	Net carbon stock change as a result of deforestation in the project area in the project scenario in stratum i at time t ; tCO ₂ e
$\Delta C_{PRJ,Deg-IT,i,t}$	Net carbon stock change as a result of forest degradation through extraction of trees for illegal timber or fuelwood and charcoal in the project area in the project scenario in stratum i at time t ; tCO ₂ e
$\Delta C_{PRJ,Deg-FSC,i,t}$	Net carbon stock change as a result of forest degradation due to selective logging of forest management areas possessing a FSC certificate in the project area in the project scenario in stratum i at time t ; tCO ₂ e

¹ VCS Module VMD0015 REDD Methodological Module: Methods for Monitoring of GHG Emissions and Removals (M-MON)

$\Delta C_{PRJ,DistPA,i,t}$	Net carbon stock change as a result of natural disturbance in the project area in the project scenario in stratum i at time t ; tCO ₂ e
$\Delta GHG_{PRJ-E,i,t}$	Greenhouse gas emissions as a result of deforestation and degradation activities within the project area in the project scenario in stratum i in year t ; tCO ₂ e
$\Delta C_{PRJ,Enh,i,t}$	Net carbon stock change as a result of forest growth and sequestration during the project in areas projected to be deforested in the baseline in stratum i at time t ; tCO ₂ e
i	1, 2, 3 ...M strata
t	1, 2, 3, ... t^* years elapsed since the start of the REDD project activity

4.2.1 Carbon stock change as a result of deforestation

<TBD>

In the project scenario it is projected that zero deforestation will occur within the project boundaries. The REDD program is focussed at the conservation of all the current forest cover in the Tavolo Project Area. Therefore the ex-ante estimation of the deforestation in the with-project case within the Tavolo Project Area is **0 tCO₂e**.

First estimation: **0 tCO₂e**.

4.2.2 Carbon stock change as a result of forest degradation through extraction of trees for illegal timber or fuelwood and charcoal

<TBD>

The first step in addressing forest degradation is to complete a participatory rural appraisal (PRA) of the communities inside and surrounding the project area to determine if there is the potential for illegal extraction of trees to occur.

First estimation: the carbon stock change as a result of forest degradation ($\Delta C_{PRJ,Deg-IT,i,t}$) can be assumed to be **0 tCO₂e** and no monitoring is needed. The PRA will be repeated every 2 years.

4.2.3 Carbon stock change as a result of forest degradation due to selective logging of forest management areas possessing a FSC certificate

<TBD>

The calculation procedure for estimating net ex post emissions and removals related to selective logging activities in the project case will be equal to the summed emissions arising from selective logging operations. Emissions resulting from selective logging may be omitted if they are deemed de minimis through the use of the module T-SIG.

The net emissions in the project case are estimated by combining:

- Emissions arising from logging gap: encompass emissions from felling timber tree and emissions from incidental damage caused by falling timber tree,
- Emissions from infrastructure: from constructing logging infrastructure for removal of timber, such as haul roads, skid trails and logging decks,
- Removals from long term wood products resulting from timber extraction

First estimation: **0 tCO₂e**.

4.2.4 Carbon stock change as a result of natural disturbance

<TBD>

First estimation: **0 tCO₂e**.

4.2.5 Greenhouse gas emissions as a result of deforestation and degradation activities

<TBD>

The GHG emissions as a result of deforestation and forest degradation activities for the with-project scenario in the Tavolo Project Area are conservatively set to **0 tCO₂e** for all years.

First estimation: **0 tCO₂e**.

4.2.6 Carbon stock change as a result of forest growth

<TBD>

First estimation: **0 tCO₂e**.

4.2.7 Sum of project carbon stock change in all pools

The carbon stock changes in the with-project scenario over the project period are given in Table 7 below.

Table 7 - Stock change in the project carbon pools

Year	Stock change due to deforestation (tCO ₂ e)	Stock change due to forest degradation (tCO ₂ e)	Stock change due to natural disturbance (tCO ₂ e)	GHG emissions due to deforestation and degradation activities (tCO ₂ e)	Sum of stock change in all project carbon pools (tCO ₂ e)
Year 1	-	-	-	-	-
Year 2	-	-	-	-	-
Year 3	-	-	-	-	-
Year 4	-	-	-	-	-
Year 5	-	-	-	-	-
Year 6	-	-	-	-	-
Year 7	-	-	-	-	-
Year 8	-	-	-	-	-
Year 9	-	-	-	-	-
Year 10	-	-	-	-	-
Year 11	-	-	-	-	-
Year 12	-	-	-	-	-
Year 13	-	-	-	-	-
Year 14	-	-	-	-	-
Year 15	-	-	-	-	-
Year 16	-	-	-	-	-
Year 17	-	-	-	-	-
Year 18	-	-	-	-	-
Year 19	-	-	-	-	-

Year 20	-	-	-	-	-
Year 21	-	-	-	-	-
Year 22	-	-	-	-	-
Year 23	-	-	-	-	-
Year 24	-	-	-	-	-
Year 25	-	-	-	-	-
Year 26	-	-	-	-	-
Year 27	-	-	-	-	-
Year 28	-	-	-	-	-
Year 29	-	-	-	-	-
Year 30	-	-	-	-	-
Total	-	-	-	-	-

4.3 Leakage

Where the specific deforestation agent can be identified, leakage does not need to be considered where it can be demonstrated that the management plans and/or land-use designations of the deforestation agent's other lands (which must be identified by location) have not materially changed as a result of the project (e.g., the deforestation agent has not designated new lands as timber concessions, increased harvest rates in lands already managed for timber, cleared intact forests for agricultural production or increased fertilizer use to enhance agricultural yields).

Therefore leakage is set to **0 tCO₂e**.

4.4 Net GHG Emission Reductions and Removals

The total net greenhouse gas emissions reductions of the Tavolo REDD Project are calculated as:

$$NER_{REDD} = \Delta C_{BSL,planned} - \Delta C_{PRJ} - \Delta C_{LK} \quad (10)$$

Where:

NER_{REDD} Total net GHG emission reductions of the REDD project activity over the project period; tCO₂e

$\Delta C_{BSL,planned}$ Net GHG emissions in the baseline from planned deforestation; tCO₂e

ΔC_{PRJ}	Net greenhouse gas emissions within the project area under the project scenario; tCO ₂ e
ΔC_{LK}	Net GHG emissions due to leakage from the REDD project activity over the project period; tCO ₂ e

The results are presented in Table 8 below.

Table 8 - The total net greenhouse gas emissions reductions of the Tavolo REDD Project

Year	Estimated baseline emissions or removals (tCO ₂ e)	Estimated project emissions or removals (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated net GHG emission reductions or removals (tCO ₂ e)
Year 1	1,542,571	-	-	1,542,571
Year 2	1,682,401	-	-	1,682,401
Year 3	1,372,328	-	-	1,372,328
Year 4	228,040	-	-	228,040
Year 5	169,593	-	-	169,593
Year 6	169,593	-	-	169,593
Year 7	169,593	-	-	169,593
Year 8	169,593	-	-	169,593
Year 9	169,593	-	-	169,593
Year 10	169,593	-	-	169,593
Year 11	113,197	-	-	113,197
Year 12	53,824	-	-	53,824
Year 13	8,035	-	-	8,035
Year 14	5,814	-	-	5,814
Year 15	5,814	-	-	5,814
Year 16	5,814	-	-	5,814
Year 17	5,814	-	-	5,814
Year 18	5,814	-	-	5,814

Year 19	5,814	-	-	5,814
Year 20	5,814	-	-	5,814
Year 21	3,812	-	-	3,812
Year 22	1,704	-	-	1,704
Year 23	79	-	-	79
Year 24	-	-	-	-
Year 25	-	-	-	-
Year 26	-	-	-	-
Year 27	-	-	-	-
Year 28	-	-	-	-
Year 29	-	-	-	-
Year 30	-	-	-	-
Total	6,064,253	-	-	6,064,253

5 MONITORING

5.1 Data and Parameters Available at Validation

Data / Parameter	<i>i</i>
Data unit	Dimensionless
Description	Stratum
Source of data	PNG's FREL; PNGFA Forest Basemap 2012
Value applied	Land-use categories present in the Tavolo Project Area: • Low altitude forest on plains and fans • Low altitude forest on uplands • Grassland • Bare areas
Justification of choice of data or description of measurement methods	PNG FREL is followed

and procedures applied	
Purpose of Data	Determination of baseline scenario Calculation of baseline emissions Calculation of project emissions
Comments	

Data / Parameter	t
Data unit	Years
Description	Years elapsed since the projected start of the REDD project activity
Source of data	
Value applied	1, 2, 3, ...
Justification of choice of data or description of measurement methods and procedures applied	
Purpose of Data	Determination of baseline scenario Calculation of baseline emissions Calculation of project emissions Calculation of leakage
Comments	

Data / Parameter	$AA_{planned, i, t}$
Data unit	Ha
Description	Annual area of baseline planned deforestation for stratum i at time t
Source of data	Deforestation plan provided by the Kakuna-Lote FCA application 2019
Value applied	See Table 3
Justification of choice of data or description of measurement methods	Project proposal and logging map attached to this PD as Appendix 3 and Appendix 4

and procedures applied	
Purpose of Data	Determination of baseline scenario Calculation of baseline emissions
Comments	

Data / Parameter	$A_{planned,i}$
Data unit	Ha
Description	Total area of planned deforestation over the baseline period for stratum i
Source of data	Deforestation plan provided by the Kakuna-Lote FCA application 2019
Value applied	16,141 ha (See Table 3)
Justification of choice of data or description of measurement methods and procedures applied	Project proposal and logging map attached to this PD as Appendix 3 and Appendix 4
Purpose of Data	Determination of baseline scenario Calculation of baseline emissions
Comments	

Data / Parameter	$D\%_{planned,i,t}$
Data unit	%
Description	Projected annual proportion of land that will be deforested in stratum i during year t
Source of data	Deforestation plan provided by the Kakuna-Lote FCA application 2019
Value applied	Year 1: 30.9% Year 2: 32.5% Year 3: 25.1% Year 4: 3.0% Year 5: 8.5%
Justification of choice of	Project proposal and logging map attached to this PD as

data or description of measurement methods and procedures applied	Appendix 3 and Appendix 4
Purpose of Data	Determination of baseline scenario Calculation of baseline emissions
Comments	Will be revisited at the time of baseline revision

Data / Parameter	$L - D_i$
Data unit	%
Description	Likelihood of deforestation for stratum i
Source of data	VMD0006
Value applied	100%
Justification of choice of data or description of measurement methods and procedures applied	VMD0006 is followed: For all areas not both under Government control and zoned for deforestation, L-Di shall be equal to 100%
Purpose of Data	Determination of baseline scenario Calculation of baseline emissions
Comments	

Data / Parameter	$\Delta C_{ABtree,i}$
Data unit	tCO ₂ e ha ⁻¹
Description	Baseline carbon stock change in aboveground tree biomass in stratum i
Source of data	PNG's FREL and IPCC 2006 Guidelines
Value applied	See Table 6
Justification of choice of data or description of measurement methods and procedures applied	VMD0006 is followed as guideline for calculations
Purpose of Data	Determination of baseline scenario Calculation of baseline emissions

Comments	
Data / Parameter	$C_{ABtree_{bsl},i}$
Data unit	tCO ₂ e ha ⁻¹
Description	Forest carbon stock in aboveground tree biomass in stratum <i>i</i>
Source of data	PNG's FREL and IPCC 2006 Guidelines
Value applied	384.3 tCO ₂ e ha ⁻¹
Justification of choice of data or description of measurement methods and procedures applied	VMD0006 is followed as guideline for calculations
Purpose of Data	Determination of baseline scenario Calculation of baseline emissions
Comments	

Data / Parameter	$C_{ABtree_{post},i}$
Data unit	tCO ₂ e ha ⁻¹
Description	Post-deforestation carbon stock in aboveground tree biomass in stratum <i>i</i>
Source of data	PNG's FREL and IPCC 2006 Guidelines
Value applied	111.7 tCO ₂ e ha ⁻¹
Justification of choice of data or description of measurement methods and procedures applied	VMD0006 is followed as guideline for calculations
Purpose of Data	Determination of baseline scenario Calculation of baseline emissions
Comments	

Data / Parameter	$\Delta C_{BBtree,i}$
------------------	-----------------------

Data unit	tCO ₂ e ha ⁻¹
Description	Baseline carbon stock change in belowground tree biomass in stratum <i>i</i>
Source of data	PNG's FREL and IPCC 2006 Guidelines
Value applied	See Table 6
Justification of choice of data or description of measurement methods and procedures applied	VMD0006 is followed as guideline for calculations
Purpose of Data	Determination of baseline scenario Calculation of baseline emissions
Comments	

Data / Parameter	$C_{BBtree\ bsl,i}$
Data unit	tCO ₂ e ha ⁻¹
Description	Forest carbon stock in belowground tree biomass in stratum <i>i</i>
Source of data	PNG's FREL and IPCC 2006 Guidelines
Value applied	142.2 tCO ₂ e ha ⁻¹
Justification of choice of data or description of measurement methods and procedures applied	VMD0006 is followed as guideline for calculations
Purpose of Data	Determination of baseline scenario Calculation of baseline emissions
Comments	

Data / Parameter	$C_{BBtree\ post,i}$
Data unit	tCO ₂ e ha ⁻¹
Description	Post-deforestation carbon stock in belowground tree biomass in stratum <i>i</i>

Source of data	PNG's FREL and IPCC 2006 Guidelines
Value applied	41.3 tCO _{2e} ha ⁻¹
Justification of choice of data or description of measurement methods and procedures applied	VMD0006 is followed as guideline for calculations
Purpose of Data	Determination of baseline scenario (AFOLU projects only) Calculation of baseline emissions
Comments	

Data / Parameter	RS
Data unit	dimensionless
Description	Ratio of belowground biomass to aboveground biomass
Source of data	PNG's FREL and IPCC 2006 Guidelines
Value applied	0.37
Justification of choice of data or description of measurement methods and procedures applied	VMD0006 is followed as guideline for calculations
Purpose of Data	Calculation of baseline emissions Calculation of project emissions Calculation of leakage
Comments	

Data / Parameter	CF
Data unit	dimensionless
Description	Conversion factor for conversion of oven-dry weight to carbon stock in tree biomass
Source of data	PNG's FREL and IPCC 2006 Guidelines
Value applied	0.47 tC tdm ⁻¹

Justification of choice of data or description of measurement methods and procedures applied	VMD0006 is followed as guideline for calculations
Purpose of Data	Calculation of baseline emissions Calculation of project emissions Calculation of leakage
Comments	

Data / Parameter	CO ₂ F
Data unit	Dimensionless
Description	Standard ratio molecular weight of CO ₂ to carbon
Source of data	PNG's FREL and IPCC 2006 Guidelines
Value applied	44/12
Justification of choice of data or description of measurement methods and procedures applied	VMD0006 is followed as guideline for calculations
Purpose of Data	Calculation of baseline emissions Calculation of project emissions Calculation of leakage
Comments	

Data / Parameter	$C_{WP,i}$
Data unit	tCO ₂ e ha ⁻¹
Description	Carbon stock entering the wood products pool at the time of deforestation from stratum <i>i</i>
Source of data	Deforestation plan provided by the Kakuna-Lote FCA application 2019
Value applied	10.2 tCO ₂ e ha ⁻¹
Justification of choice of data or description of	Followed VMD0005, using values from deforestation plan

measurement methods and procedures applied	
Purpose of Data	Determination of baseline scenario Calculation of baseline emissions
Comments	

Data / Parameter	$C_{XP,i}$
Data unit	tCO ₂ e ha ⁻¹
Description	Mean stock of extracted biomass carbon at the time of deforestation from stratum i
Source of data	Deforestation plan provided by the Kakuna-Lote FCA application 2019
Value applied	13.4 tCO ₂ e ha ⁻¹
Justification of choice of data or description of measurement methods and procedures applied	Followed VMD0005, using values from deforestation plan
Purpose of Data	Determination of baseline scenario Calculation of baseline emissions
Comments	

Data / Parameter	WW_{ty}
Data unit	dimensionless
Description	Wood waste. The fraction immediately emitted through mill inefficiency by class of wood product ty
Source of data	VMD0005
Value applied	0.24
Justification of choice of data or description of measurement methods and procedures applied	Default factor for wood waste of 0.24 as given by VCS module VMD0005 for developing countries Since VMD0005 provides a single default wood waste factor for all timber categories in the developing countries, only one class

	of Wood products is used for the calculation of the Harvested Wood Product pool
Purpose of Data	Determination of baseline scenario Calculation of baseline emissions
Comments	

Data / Parameter	t_y
Data unit	
Description	Wood product class
Source of data	VMD0005
Value applied	defined here as sawnwood (s), wood-based panels (w), other industrial roundwood (oir), paper and paper board (p), and other (o)
Justification of choice of data or description of measurement methods and procedures applied	Since VMD0005 provides a single default wood waste factor for all timber categories in the developing countries, only one class of Wood products is used for the calculation of the Harvested Wood Product pool
Purpose of Data	Determination of baseline scenario Calculation of baseline emissions
Comments	

Data / Parameter	$C_{WP100,i}$
Data unit	tCO _{2e} ha ⁻¹
Description	Carbon stock entering the wood products pool at the time of deforestation that is expected to be emitted over 100-years from stratum i
Source of data	Deforestation plan provided by the Kakuna-Lote FCA application 2019
Value applied	8.0 tCO _{2e} ha ⁻¹
Justification of choice of data or description of	Followed VMD0005, using values from deforestation plan

measurement methods and procedures applied	
Purpose of Data	Determination of baseline scenario Calculation of baseline emissions
Comments	

Data / Parameter	<i>SLF_{ty}</i>
Data unit	Dimensionless
Description	Fraction of wood products that will be emitted to the atmosphere within 5 years of timber harvest by class of wood product <i>ty</i>
Source of data	VMD0005
Value applied	0.3
Justification of choice of data or description of measurement methods and procedures applied	Followed VMD0005, using default fraction parameters for roundwood
Purpose of Data	Determination of baseline scenario Calculation of baseline emissions
Comments	

Data / Parameter	<i>OF_{ty}</i>
Data unit	Dimensionless
Description	Fraction of wood products that will be emitted to the atmosphere between 5 and 100 years of timber harvest by class of wood product <i>ty</i>
Source of data	VMD0005
Value applied	0.7
Justification of choice of data or description of measurement methods and procedures applied	Followed VMD0005, using default fraction parameters for roundwood

Purpose of Data	Determination of baseline scenario Calculation of baseline emissions
Comments	

Data / Parameter	$\Delta C_{BSL,planned}$
Data unit	tCO ₂ e
Description	Net GHG emissions in the baseline from planned deforestation <i>i</i>
Source of data	Based on deforestation plan provided in the Kakuna-Lote FCA application 2019, and default C-stocks provided in PNG's FREL and IPCC 2006 Guidelines
Value applied	6,028,743 tCO ₂ e; See Table 6
Justification of choice of data or description of measurement methods and procedures applied	Project proposal and logging map attached to this PD as Appendix 3 and Appendix 4
Purpose of Data	Determination of baseline scenario Calculation of baseline emissions
Comments	

Data / Parameter	$\Delta C_{BSL,i,t}$
Data unit	tCO ₂ e
Description	Sum of the baseline carbon stock change in all pools in stratum <i>i</i> at time <i>t</i>
Source of data	Based on deforestation plan provided in the Kakuna-Lote FCA application 2019, and default C-stocks provided in PNG's FREL and IPCC 2006 Guidelines
Value applied	See Table 6
Justification of choice of data or description of measurement methods and procedures applied	Project proposal and logging map attached to this PD as Appendix 3 and Appendix 4
Purpose of Data	Determination of baseline scenario

	Calculation of baseline emissions
Comments	

Data / Parameter	$GHG_{BSL,E,i,t}$
Data unit	tCO ₂ e
Description	Greenhouse gas emissions as a result of deforestation activities within the project boundary in the baseline stratum i during project year t
Source of data	
Value applied	0 tCO ₂ e
Justification of choice of data or description of measurement methods and procedures applied	The GHG emissions as a result of deforestation activities in the baseline for the Tavolo Project Area are conservatively set to 0 tCO₂e for all years
Purpose of Data	Determination of baseline scenario Calculation of baseline emissions
Comments	

Data / Parameter	$E_{FC,i,t}$
Data unit	tCO ₂ e
Description	Emission from fossil fuel combustion in stratum i in year t
Source of data	
Value applied	0 tCO ₂ e
Justification of choice of data or description of measurement methods and procedures applied	The Emission from fossil fuel combustion in the baseline for Tavolo the Project Area are conservatively set to 0 tCO₂e for all years
Purpose of Data	Determination of baseline scenario Calculation of baseline emissions
Comments	

Data / Parameter	$E_{BiomassBurn\ ,i,t}$
Data unit	tCO ₂ e
Description	Non-CO ₂ emissions due to biomass burning in stratum <i>i</i> in year <i>t</i>
Source of data	
Value applied	0 tCO ₂ e
Justification of choice of data or description of measurement methods and procedures applied	The Non-CO ₂ emissions due to biomass burning in the baseline for Tavolo the Project Area are conservatively set to 0 tCO₂e for all years
Purpose of Data	Determination of baseline scenario Calculation of baseline emissions
Comments	

Data / Parameter	$N_2O_{direct-N,i,t}$
Data unit	tCO ₂ e
Description	Direct N ₂ O emission as a result of nitrogen application on the alternative land use within the project boundary in stratum <i>i</i> in year <i>t</i>
Source of data	
Value applied	0 tCO ₂ e
Justification of choice of data or description of measurement methods and procedures applied	The Direct N ₂ O emission as a result of nitrogen application in the baseline for Tavolo the Project Area are conservatively set to 0 tCO₂e for all years
Purpose of Data	Determination of baseline scenario Calculation of baseline emissions
Comments	

5.2 Data and Parameters Monitored

Data / Parameter	ΔC_{PRJ}
Data unit	tCO ₂ e
Description	Net greenhouse gas emissions within the project area under the project scenario
Source of data	Tavolo Land Use Plan
Description of measurement methods and procedures to be applied	
Frequency of monitoring/recording	
Value applied	See Table 7
Monitoring equipment	
QA/QC procedures to be applied	
Purpose of data	Calculation of project emissions
Calculation method	
Comments	

Data / Parameter	$\Delta C_{PPRJ,DefPA,i,t}$
Data unit	tCO ₂ e
Description	Net carbon stock change as a result of deforestation in the project area in the project scenario in stratum <i>i</i> at time <i>t</i>
Source of data	Tavolo Land Use Plan
Description of measurement methods and procedures to be applied	
Frequency of monitoring/recording	
Value applied	See Table 7; 0 tCO ₂ e
Monitoring equipment	

QA/QC procedures to be applied	
Purpose of data	Calculation of project emissions
Calculation method	
Comments	

Data / Parameter	$\Delta C_{PRJ, Deg-IT,i,t}$
Data unit	tCO ₂ e
Description	Net carbon stock change as a result of forest degradation through extraction of trees for illegal timber or fuelwood and charcoal in the project area in the project scenario in stratum <i>i</i> at time <i>t</i>
Source of data	Tavolo Land Use Plan and PRA
Description of measurement methods and procedures to be applied	
Frequency of monitoring/recording	
Value applied	See Table 7; 0 tCO ₂ e
Monitoring equipment	
QA/QC procedures to be applied	
Purpose of data	Calculation of project emissions
Calculation method	
Comments	

Data / Parameter	$\Delta C_{PRJ, Deg-FSC,i,t}$
Data unit	tCO ₂ e
Description	Net carbon stock change as a result of forest degradation due to selective logging of forest management areas possessing a FSC certificate in the project area in the project scenario in stratum <i>i</i>

	at time t
Source of data	Tavolo Land Use Plan and FSC Logging Plan for Tavolo
Description of measurement methods and procedures to be applied	
Frequency of monitoring/recording	
Value applied	See Table 7; 0 tCO ₂ e
Monitoring equipment	
QA/QC procedures to be applied	
Purpose of data	Calculation of project emissions
Calculation method	
Comments	

Data / Parameter	$\Delta C_{PRJ,DistPA,i,t}$
Data unit	tCO ₂ e
Description	Net carbon stock change as a result of natural disturbance in the project area in the project scenario in stratum i at time t
Source of data	
Description of measurement methods and procedures to be applied	
Frequency of monitoring/recording	
Value applied	See Table 7; 0 tCO ₂ e
Monitoring equipment	
QA/QC procedures to be applied	
Purpose of data	Calculation of project emissions

Calculation method	
Comments	

Data / Parameter	$\Delta GHG_{PRJ-E,i,t}$
Data unit	tCO ₂ e
Description	Greenhouse gas emissions as a result of deforestation and degradation activities within the project area in the project scenario in stratum <i>i</i> at time <i>t</i>
Source of data	Tavolo Land Use Plan and FSC Logging Plan for Tavolo
Description of measurement methods and procedures to be applied	
Frequency of monitoring/recording	
Value applied	See Table 7; 0 tCO ₂ e
Monitoring equipment	
QA/QC procedures to be applied	
Purpose of data	Calculation of project emissions
Calculation method	
Comments	

Data / Parameter	$\Delta C_{PRJ,Enh,i,t}$
Data unit	tCO ₂ e
Description	Net carbon stock change as a result of forest growth and sequestration during the project in areas projected to be deforested in the baseline in stratum <i>i</i> at time <i>t</i>
Source of data	Tavolo Land Use Plan and FSC Logging Plan for Tavolo
Description of measurement methods and procedures to be applied	

Frequency of monitoring/recording	
Value applied	See Table 7; 0 tCO ₂ e (conservative)
Monitoring equipment	
QA/QC procedures to be applied	
Purpose of data	Calculation of project emissions
Calculation method	
Comments	

Data / Parameter	ΔC_{LK}
Data unit	tCO ₂ e
Description	Net GHG emissions due to leakage from the REDD project activity over the project period
Source of data	
Description of measurement methods and procedures to be applied	
Frequency of monitoring/recording	
Value applied	
Monitoring equipment	
QA/QC procedures to be applied	
Purpose of data	Calculation of project emissions
Calculation method	
Comments	

Data / Parameter	NER_{REDD}
Data unit	tCO ₂ e

Description	Total net GHG emission reductions of the REDD project activity over the project period
Source of data	
Description of measurement methods and procedures to be applied	
Frequency of monitoring/recording	
Value applied	
Monitoring equipment	
QA/QC procedures to be applied	
Purpose of data	Calculation of project emissions
Calculation method	
Comments	

5.3 Monitoring Plan

<TBD>

To work in line with PNG's national REDD+ strategy, the Tavolo REDD project follows the monitoring procedures set out in the National Forest Monitoring System (NFMS) as described in PNG's FREL and PNG's National REDD+ Strategy.

5.3.1 Monitoring deforestation

National Forest Monitoring System (NFMS)

The forest cover in the Tavolo Project Area will be monitored using PNG's NFMS managed by the PNGFA (see Box 1 below). Any change in forest cover in the Tavolo Project Area which is reported through the NFMS.

Global Forest Watch (GFW)

GFW will also be used besides the NFMS to monitor any change in forest cover in the Tavolo Project Area. Two GFW datasets will be used for monitoring, 1) the annual detection of tree cover loss using 30x30m Landsat imagery, and 2) weekly GLAD alerts also using 30x30m Landsat imagery at a resolution of 30x30m.

Field inspections

The Community conservation committee established from within the Tavolo Community Conservation Association will be responsible to monitor the forest area in the Tavolo Project Area over time. Any tree cover loss reported by NFMS and GFW in the Tavolo Project Area will be verified by the Community conservation committee in the field. To assist this verification in the field, mobile applications will be used such as the 'Forest Watcher' app developed by GFW. Besides any follow-up on reported alerts, the Forest Monitoring Team will also conduct regular patrols and report any signs of deforestation or forest degradation in the Tavolo Project Area.

Box 1 - Description of PNG's NFMS

The National Forest Monitoring System provides transparent information on the status of forests in a country. It has two core functions: 1) To monitor changes within a country's forests: this will help improve forest management and planning; and 2) To measure, report and verify (MRV) levels of GHG emissions from forests. The NFMS will generate data and reports on PNG's GHG emissions from forests that will be sent to the UNFCCC and form the basis for results-based payments from the international community.

The Government of PNG, in partnership with the UN- REDD Programme and JICA, has been developing systems to map and monitor the country's forests – "Terra PNG" (managed by CCDA) and the National Forest Monitoring Portal(<http://png-nfms.org/portal/>) (managed by the PNGFA). This information will be linked with ground- based forest measurements through the National Forest Inventory to measure the carbon stocks of PNG's forests. The Forest Monitoring portal was established and launched by the government in 2016.

5.3.2 Monitoring forest degradation due to illegal logging

The Community conservation committee will conduct field inspections in the Tavolo Project Area on a regular basis. Any incidences of (illegal) forest degradation will be reported by the committee.

Besides the field inspection, a forest inventory will be conducted on a regular basis on Permanent Sample Plots in the Tavolo Project Area. The results of this forest inventory will be used to monitor if there are signs of any forest degradation over time in the project area.

5.3.3 Monitoring forest degradation due to selective logging under FSC

The impact of any small-scale portable sawmilling operation taking place in the production forest area of the Tavolo land use plan area will be monitored by FORCERT as part of their FSC Group certificate monitoring plans

5.3.4 Monitoring areas undergoing natural disturbance

The Community conservation committee will conduct field inspections in the Tavolo Project Area on a regular basis. Any incidences of natural disturbance will be reported by the team.

5.3.5 Monitoring GHG emissions as a result of deforestation and degradation activities

The level of GHG emissions resulting from deforestation and degradation activities within the forest production and conversion zones of the Tavolo land use plan area will be monitored by FORCERT as part of their Group certification system monitoring plans.

5.3.6 Monitoring areas undergoing carbon stock enhancement

The Tavolo REDD project will apply a forest inventory in the Tavolo Project Area every 5 years. During this forest inventory the aboveground tree biomass will be measured on Permanent Sample Plots (PSPs) located in the area according to a regular grid. This forest inventory will provide insights in the forest growth during the project period.

5.3.7 Monitoring leakage

5.3.8 Baseline revision

The baseline of the Tavolo REDD Project will be revised after every 10 years during the project period. The procedure used to update the baseline will be the same as used for the baseline determination in this PD.

LITERATURE

Act Now, 2015. PNG: Court rulings confirm SABLs null and void; an article published on www.farmlandgrab.org; 27 Aug 2015; <https://farmlandgrab.org/25259>

Chatham House, 2014. Illegal Logging in Papua New Guinea, Sam Lawson

Filer C., 2011. The New Land Grab in Papua New Guinea, a paper presented at the International Conference on Global Land Grabbing, 6-8 April 2011

Filer C., 2012. Why green grabs don't work in Papua New Guinea, Journal of Peasant Studies

Filer C., et al, 2017. Kastom, Property and Ideology, Land Transformations in Melanesia

Filer C., 2019. Presentation PNG Forest Summit 2019

GIZ, 2014. Papua New Guinea: Legal Framework for REDD+

Global Witness, 2014. The people and forests of Papua New Guinea under threat: the government's failed response to the largest land grab in modern history; A Global Witness briefing

Global Witness, 2017. Stained Trade, How US imports of exotic flooring from China risk driving the theft of indigenous land and deforestation in Papua New Guinea

Global Witness, 2018. A major liability. Illegal logging in Papua New Guinea threatens china's timber sector and global reputation

Government of Papua New Guinea, 2017. Papua New Guinea National REDD+ Strategy for the period 2017-2027, Papua New Guinea

Government of Papua New Guinea, 2017. Papua New Guinea National REDD+ Forest Reference Level, Modified Submission for UNFCCC Technical Assessment in 2017

Greenpeace, 2012. Up for Grabs, Millions of hectares of customary land in PNG stolen for logging

Hansen, et al., 2013, High-Resolution Global Maps of 21st-Century Forest Cover Change: Science, v. 342, no. 6160, p. 850-853, at <http://www.sciencemag.org/content/342/6160/850.abstract>

Intergovernmental Panel on Climate Change (IPCC), 2003. Good Practice Guidance for Land Use, Land-Use Change and Forestry

Intergovernmental Panel on Climate Change (IPCC), 2006. 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4 Agriculture, Forestry and Other Land Use

Kakuna-Lote LOC, 2019. Kakuna-Lote Project proposal & FCA Application

NEC, 2014. NEC Decision 184/2014, clause 8; <https://actnowpng.org/content/full-nec-decision-sabl-land-grab>

Oakland Institute, 2013. On Our Land, Modern Land Grabs Reversing Independence In Papua New Guinea

Gabriel et al., 2017. Oil Palm Development and Large-Scale Land Acquisitions in Papua New Guinea

Mirou N., 2013. Commission of Inquiry into Special Agriculture and Business Lease (C.O.I. SABL): Report

Nelson et al., 2014. Oil Palm and Deforestation in Papua New Guinea

Numapo J., Jerewai A., & Mirou N., 2012. Transcript of Proceedings: Special Meeting (Commission of Inquiry into SABL)

Numapo J., 2013. Commission of Inquiry into Special Agriculture and Business Lease (C.O.I. SABL): Report

Hambloch, 2018. Land Formalization Turned Land Rush: The Case of the Palm Oil Industry in Papua New Guinea

APPENDIX 1 - MOU BETWEEN CCDA ANDFORCERT LTD

MEMORANDUM OF UNDERSTANDING

BETWEEN

**CLIMATE CHANGE AND DEVELOPMENT AUTHORITY
OF THE INDEPENDENT STATE OF PAPUA NEW GUINEA**

AND

FORCERT LIMITED

This Memorandum of Understanding (hereafter referred to as "**the MOU**") is made this 1st day of January, 2018.

BETWEEN:

The **CLIMATE CHANGE & DEVELOPMENT AUTHORITY**, (hereafter referred to as "**CCDA**"), an official Authority of The Independent State of Papua New Guinea, created by the Climate Change (Management) Act 2015, having its registered address at Avara Annex Building, Brampton street, Port Moresby CBD, Papua New Guinea, PO Box 4017, Boroko, National Capital District.

AND:

FORCERT LIMITED (hereafter referred to as "**FORCERT**"), a PNG based and owned not-for-profit service company, incorporated under the Investment Promotion Authority Act, having its registered address at the Walindi Nature Centre, Talasea Highway, P O Box 772, Kimbe, West New Britain Province.

Each a "**Party**" and together the "**Parties**" to this MOU.

WITH RESPECT TO:

Mutual understanding, cooperation & collaboration and assistance.



A. PURPOSE OF THE MEMORANDUM OF UNDERSTANDING (MOU)

1. The purpose of the MOU between CCDA and FORCERT is:
 - 1.1 To continue the partnership between the CCDA and FORCERT to work together on issues related to Payment for Environmental Services (PES), in particular Reduced Emissions from Deforestation and Degradation, Conservation and Environmental Sustainability (REDD+), both at the national, subnational and the community level, as detailed in Part C below.
 - 1.2 To recognize and support FORCERT in its trialing of PES concepts at the community level.
 - 1.3 To recognize, utilize and promote the national level PES trial work of FORCERT for relevant PNG Government legislation and regulation, and for all international PES/REDD negotiations and meetings.
 - 1.4 To utilize the national and community level PES trial work of FORCERT, and work in close collaboration with other relevant Government Departments and Institutions and other stakeholders, to develop one National system to provide long-term support for community conservation efforts, that will incorporate REDD+ together with all other forms of financing mechanisms for these community conservation efforts .
 - 1.5 To inform and educate the Management and Staff of CCDA and its associated institutions and government departments on the FORCERT PES trial work, both at the national and community level.
 - 1.6 To develop a working relationship between the CCDA and FORCERT.

B. BACKGROUND TO THE MOU

2. This MOU formally recognizes the FORCERT-PES trial work as a useful practical learning experience, providing analysis and results that will inform decision makers in the Government of PNG, the CCDA and development partners in their climate change related work, and in particular on developing a transparent and equitable system for delivering benefits for environmental service management to communities in PNG.
3. This MOU formally recognizes and commends the efforts of FORCERT in its work with PNG communities, in particular its empowerment of communities to do sustainable land and resource use planning and management and developing sustainable livelihood options.
4. As a central government agency, the CCDA has only limited reach to communities. The limitations of CCDA and the unique role and position of FORCERT have



contributed to the CCDA's decision to initiate this Partnership to be able to utilize the results of FORCERT's trial work in PES community concepts, for CCDA's overall climate change related work, and in particular its work on REDD and PES, and in general in relation to Green Economic Development.

5. This MOU also formally recognizes and commends the efforts of the Expert Consultation Group, a group of well-respected PNG experts, facilitated by FORCERT, in developing a Proposed PES System for PNG.
6. The CCDA has decided to adopt the concepts and ideas of the Proposed PES System for PNG for inclusion in all relevant Government policy, legislation and regulation. The CCDA recognizes the need to develop one overall National PES System that provides support for community level conservation efforts.

C. MOU JOINT COMMITMENTS

7. In the spirit of mutual respect we, the CCDA and FORCERT, as partners to this MOU, commit ourselves to the following:
 - 7.1 FORCERT and the CCDA will cooperate and collaborate in the FORCERT PES trial work at the community level, using this work to test all possible aspects of the Proposed PES System for PNG, including trial environmental service payments to communities. The outcomes of these trials will be compared with studies on PES systems in other countries, to ensure lessons learned and success stories from these countries inform the decisions on development of a National PES System for PNG.
 - 7.2 The CCDA will support FORCERT in the establishment of a PES Trust Fund , which will source financing from a range of sources, including voluntary PES markets, for the purpose of demonstrating environmental service payments to FORCERT partner communities. These demonstration activities are part of a practical learning experience essential for the development of a PES system and it's Benefit Sharing Mechanism at the national level.
 - 7.3 The CCDA will closely cooperate and collaborate with FORCERT as a partner in the preparation and implementation of any national or sub-national demonstration PES/REDD activities, projects or programs funded through the Green Climate Fund or similar funding initiatives.
 - 7.4 The CCDA and FORCERT will cooperate and collaborate to incorporate the concepts and ideas of the Proposed PES System for PNG into all relevant Government policy, legislation and regulation.
 - 7.5 The CCDA will promote the concepts and ideas of the Proposed PES System for PNG in all its internal, interdepartmental, subnational, national and international work.




- 7.6 The CCDA and FORCERT will cooperate and collaborate to incorporate the concepts and ideas of the Proposed PES System for PNG into the PES/REDD+ demonstration activities at the Provincial level, to develop and test a robust, transparent and practical support system for community level conservation efforts. The CCDA and FORCERT will work in close consultation with other relevant Government Departments, Authorities and Institutions, and other stakeholders.
- 7.7 The CCDA and FORCERT will use their joint demonstration activities to strengthen the relationships with the Provincial Climate Change Committees and focal points in Madang, East New Britain and West New Britain.
- 7.8 The CCDA and FORCERT will ensure the demonstration activities under Clause 7.6 are designed and implemented in a manner that allows transfer to a national level system that will form part of a national PES/REDD+ mechanism.
- 7.9 The CCDA commits itself to facilitate access to funding for FORCERT to help implement and strengthen both its community level and national level work.
- 7.10 FORCERT commits itself to providing in-kind resources and the manpower for the management of its commitments under the Partnership activities.
- 7.11 The CCDA will utilize the role and position of FORCERT through its work with its partner communities and partner organisations to disseminate education and awareness information and materials related to issues of climate change.
- 7.12 FORCERT commits itself to sharing and discussing the results of its PES trial work with the CCDA and its associated institutions and government departments, in particular to create an understanding with all Management and Staff on the considerations and implications of PES at the community level, and the consequences this has for the overall work on climate change and sustainable development in PNG.
- 7.13 The CCDA commits itself to providing or facilitating and funding any relevant training and capacity building for FORCERT staff, identified as beneficial for the implementation of this MOU.
- 7.14 FORCERT and the CCDA will each appoint a contact person responsible for overseeing implementation of this MOU, being the highest ranking relevant staff person of each party. Both parties will share relevant data and information on their planning and development progress of all activities related to this MOU in a timely manner, with ample notice given on expected attendance or contributions from the other Partner.
- 7.15 FORCERT will be available as a resource person and consultant to the CCDA to assist in meeting and training organisation and facilitation (in line with 7.10 above), provided all costs for this assistance are met and these activities do not hinder the implementation of FORCERT's overall work plan.

7.16 The CCDA will invite FORCERT to attend any official meeting which requires FORCERT's attendance (in line with 7.10 above), and whenever possible cover the expenses for this attendance.

7.17 The CCDA confirms the membership of FORCERT for CCDA's Technical Working Committee on REDD+ and MRV.

7.18 Both Parties will promote appreciation of the inherent cultural, environmental and spiritual value of forests and natural resources in a holistic manner, and will follow a pre-cautionary approach in all dealings with communities, promoting general community level benefits, including support for sustainable livelihood options, and avoiding a focus on the monetary value of the Environmental Services and unrealistic expectations of this value.

7.19 The CCDA and FORCERT will meet annually and whenever circumstances may demand it, to review and analyze the progress made in implementation of the MOU, and to adopt new initiatives including any new agreements as deemed appropriate, or to make changes to this agreement as stipulated in Part D, Clause 8 below.

D. TERM OF THE MOU

8. This MOU will commence on the date of execution of this MOU and will continue in force for three (3) years and thereafter from year to year subject to the provisions herein stated and or as amended from time to time, following review meetings by the Parties as stipulated in Part C, Clause 7.15 above.

E. CONTINUATION OF THE MOU

9. This MOU will remain valid with all its clauses continued when and if the CCDA continues to function under any other name or status as the PNG Government body responsible for Climate Change through a Parliamentary or NEC decision.

F. PARTNERSHIP STATUS

10. Except for Sections F to M inclusive which are binding on the Parties, the Parties expressly acknowledge nothing in this MOU will be construed as creating a legal relationship between the Parties of agency, partnership, or joint venture, nor to render any Party liable for any debts or obligations incurred by the other. No Party is authorized to make representations on behalf of another or to bind another Party in any manner whatsoever.

11. The Parties to this MOU agrees not to use the name, logos or marks of another Party without obtaining prior written consent of the other Party. Notwithstanding the



foregoing, no additional authorization will be required for any use of a Party's name, logo or other trademark in any publication in any medium, form or format, or any press release or public announcement that has been approved in writing in advance by all Parties.

12. The Parties agree that this MOU does not restrict or prohibit any Party from entering into agreements with similar or related purposes with other public or private companies, governmental or nongovernmental organizations, or any individuals or entities.

G. INTELLECTUAL PROPERTY

13. For purposes of this Section G. the term "Creative Work" shall mean, without limitation, maps, data and databases, reports, studies, photographs, computer programs, drawings, writings, documents, processes, products, and other materials produced pursuant to this MOU, whether on paper, disk, tape, digital file or any other media. Unless otherwise agreed to in writing and at all times subject to Clauses 11 and 14, each Party agrees to the following provisions on intellectual property:

- 13.1 Each Party shall retain all rights (including copyright, patent, trademark and other proprietary rights) in a Creative Work created by or belonging to a Party prior to this MOU (hereinafter "Background Information"). Each Party agrees to share such Background Information as appropriate to achieve the objectives of this MOU. All Background Information owned by a Party and disclosed to the other Parties remains the exclusive intellectual property of the disclosing Party and may be used by the other Parties only in furtherance of the objectives of this MOU, subject to applicable license restrictions.

- 13.2 The copyright, patent and other intellectual property rights in a Creative Work created or invented by a Party pursuant to this MOU will be and shall remain the exclusive property of the Party that creates or invents the Creative Work and the other Parties may use such Creative Work with the grant of a license.

- 13.3 If a breach occurs in the use of a Creative Work without prior written consent of the licensed party, or without proper acknowledgement of source, the party in breach shall be required to publicly acknowledge its breach within 3 working days and properly identify the source of the Creative Work.

H. CONFIDENTIALITY

14. Both Parties agree that it shall keep secret and confidential the other's Confidential Information (indicated as such by the other Party) received in the course of the Parties' relationship, or otherwise obtained, utilizing at least the same degree of care that it exercises with respect to its own Confidential Information, but in no event less than a reasonable degree of care. The receiving Party shall disclose the Confidential



Information of the other Party only to its employees, agents, contractors and affiliates reasonably necessary in order for the receiving Party to perform its obligations and exercise its rights under this MOU. Each Party hereto shall also cause its affiliates, agents, contractors, and employees to abide by this Section and the other pertinent parts of this MOU.

I. INDEMNIFICATION

15. The CCDA agrees to indemnify and keep indemnified during the period of this agreement CCDA (including all staff of CCDA) from any liability whatsoever that may arise in the course of carrying out the functions and duties of FORCERT in accordance with this MOU, with the exception of death or injury.
16. FORCERT agrees to indemnify and keep indemnified during the period of this MOU, FORCERT (including all staff of FORCERT) from any liability whatsoever that may arise in the course of carrying out the functions and duties of CCDA in accordance with this MOU, with the exception of death or injury.

J. AGREEMENT ON COST

17. No claims for or deductions in respect of expenses incurred by both parties in the performance of their functions and duties under this MOU will be made or allowed by one party to the other party, except where expressly agreed to beforehand in writing by both Parties.
18. All agreed claims for expenses will be settled in a timely manner, in accordance with normal business practices.

K. DISPUTE RESOLUTION

19. The Parties hereby agree that, in the event of any dispute, controversy or claim between the Parties relating to this MOU, the Parties will seek to resolve the dispute through informal discussions. In the event any dispute, controversy or claim cannot be resolved informally within sixty (60) days, the Parties either agree that the dispute, controversy or claim will be settled by binding arbitration in accordance with PNG law, or Clause 22.1 below may be followed.
20. The parties are not obliged to refer the matter to arbitration unless the Parties are in agreement that matter is significant to meeting the undertakings under the MOU. Arbitration should commence within thirty (30) days after the Parties agree to it, and all costs will be met by the CCDA.



L. AMMENDMENT AND TERMINATION OF THE MOU

21. Both Parties will have the right to request amendments to this MOU following the meetings as stipulated in Part C, Clause 7.15
22. Both Parties will have the right to terminate this MOU forthwith at any time by way of a notice in writing to the other party of the following events:
 - 22.1 if all attempts to resolve a dispute through informal discussions have been exhausted, or
 - 22.2 if a Party commits a breach of any of the terms or conditions of this MOU, or
 - 22.3 if a Party is guilty of any conduct which is prejudicial to the interest of both Parties.

M. WARRANTIES

23. This MOU embodies the entire understanding of the parties and there are no warranties, promises, terms, conditions or obligations, oral or written, express or implied other than those contained in this MOU.

And the Parties have read and understood the terms and conditions herein and have set their seals herein.

This MOU is hereby signed by

On behalf of the Climate Change and
Development Authority



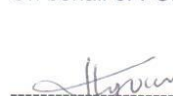
Ruel Yamuna
Managing Director



Signature of Witness

EUNICE DUES - SNR OFFICER
Name of Witness

On behalf of FORCERT Limited



Katherine Yuave
Chairperson Board of Directors



Signature of Witness

Name of Witness:



APPENDIX 2 – DDLL MUKUS-MELKOI PROJECT PROPOSAL

<attached as pdf>

APPENDIX 3 – KAKUNA-LOTEAGRO FORESTRY & REFORESTATION PLANTATION DEVELOPMENT PROJECT (FCA PROJECT PROPOSAL)

<attached as pdf>

APPENDIX 4 – KAKUNA-LOTE AGRO FORESTRY & REFORESTATION PLANTATION DEVELOPMENT PROJECT (FCA PROJECT MAP)



APPENDIX 5 – STANDARD OPERATING PROCEDURE FOREST INVENTORY TAVOLO

<attached as pdf>