



**Verified Carbon
Standard**

NON-PERMANENCE RISK REPORT

PNG COMMUNITIES BEST REDD - TAVOLO PROJECT



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

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1 INTERNAL RISK

Project Management		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Not applicable, no trees are planted in the REDD project	0
b)	Ongoing enforcement to prevent encroachment by outside actors is not required to protect more than 50% of stocks on which GHG credits have previously been issued	0
c)	Both FORCERT and Face the Future have a well-qualified and experienced management team in place to ensure that the PNG BEST REDD Tavolo project is implemented effectively. The project has senior local management with a track record in forest conservation, forestry and carbon operations	0
d)	FORCERT is a Non-Government Organization (registered as a Not-For-Profit-Company) based on New Britain Island in Papua New Guinea. about 20 staff that work from three offices with remote communities in the East and West New Britain, New Ireland, Morobe and Madang provinces. They have about 20 staff that work from three offices with remote communities in the East and West New Britain, New Ireland, Morobe and Madang provinces. So management team for the REDD project is present in the country.	0
e)	Face the Future has experience in the development, management and monitoring of AFOLU projects under VCS and CCB since 2011	-2
f)	An adaptive management plan for the REDD project is in place. See "Tavolo Community Conservation Association Management Plan 2022-2032" under CCB documentation.	-2
Total Project Management (PM) [as applicable, (a + b + c + d + e + f)]		-4
Total may be less than zero.		

Financial Viability		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Not applicable, because the project cash flow breakeven point is not greater than 10 years from this current risk assessment.	

b)	Not applicable, because the cash flow breakeven point is not between 7 and up to 10 years of from the current risk assessment.	
c)	Not applicable, because the cash flow breakeven point is not between 4 and up to 7 years of from the current risk assessment.	
d)	This is less than 4 years, since FORCERT covers project development and implementation costs	0
e)	Not applicable, because the project has secured 100% of the funding before it reaches breakeven.	
f)	Not applicable, because the project has secured 100% of the funding before it reaches breakeven.	
g)	Not applicable , because the project has secured 100% of the funding before it reaches breakeven.	
h)	Since FORCERT covers all costs of Project Development and implementation, the project has secured 100% of the funding until it reaches breakeven.	0
i)	Not applicable.	0
Total Financial Viability (FV) [as applicable, ((a, b, c or d) + (e, f, g or h) + i)]		0
Total may not be less than zero.		

Opportunity Cost		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Not applicable, because (e) applies.	0
b)	Not applicable, because (e) applies.	0
c)	Not applicable, because (e) applies.	0
d)	Not applicable, because (e) applies.	0
e)	Project Scenario income from Carbon Market is: 370 tCO ₂ /ha * 17.50 USD = 6,475 USD/ha; Profitability most profitable alternative (oil palm) starts with 4,500 USD/ha (https://www.worldagroforestry.org/blog/2012/10/25/the-economics-of-oil-palm-in-indonesia);	-2

	So conclusion: NPV from project activities is expected to be between 20% and up to 50% more profitable than the most profitable alternative land use activity	
f)	Not applicable, because (e) applies.	0
g)	Project proponent is a non-profit organization	-2
h)	True, Project is protected by legally binding commitment to continue management practices that protect the credited carbon stocks over the length of the project lifetime of 30 years. PNG Communities BEST Program Membership Agreement signed in November 2021 between TCCA and FORCERT (Appendix 1. of the VCS PD v1.5) and Legal clearance for this Agreement from the PNG State Solicitor's Office in November 2021 (Appendix 2. of the VCS PD v.1.5); the Agreement is legally cleared by the highest legal authority in PNG as required under the PNG Climate Change (Management) Act 2015, and constitutes a legally binding commitment by both parties to continue management practices for the project's lifetime.	-2
i)	Not applicable, because agreements are only up to the current length of the project contract period of 30 years.	0
Total Opportunity Cost (OC) [as applicable, (a, b, c, d, e or f) + (g + h or i)] Total may be less than 0.		-6

Project Longevity		
a)	Not applicable, see (b) below.	
b)	The Agreement between Forcert and the Tavolo Community is for a period of 30 years during which the area needs to be managed according to the contractual arrangements. = 30 – (30 / 2) = 15 PNG Communities BEST Program Membership Agreement signed in November 2021 between TCCA and FORCERT (Appendix 1. of the VCS PD v1.5); the Agreement specifies the 30 year duration of the project and the obligation by both parties to maintain their respective responsibilities regarding project management for the duration of the project.	15
Total Project Longevity (PL) May not be less than zero		15

Internal Risk	
Total Internal Risk (PM + FV + OC + PL)	5
Total may not be less than zero.	

2 EXTERNAL RISKS

Land Tenure and Resource Access/Impacts		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Ownership and resource access/use rights are held by the Tavolo community	0
b)	Not applicable, the Tavolo Community holds all rights	0
c)	Although there is currently an FCA and SABL that conflict with the Tavalo Community customary land ownership, this FCA and SABL are challenged in court to be officially nullified as one of the project's main activities and milestones (see project description). Although the FCA and SABL have both been officially issued by the relevant authorities, this has been done in an incorrect and illegal manner. For the Mukus-Melkoi SABL two official government investigations have led to this conclusion and the recommendation that the SABL is nullified. The Tavolo project is enabling this incorrect and illegal FCA and SABL issuance to be taken to court for them both to be nullified (and thus results in resolving the conflicts). A court order to stay the FCA until the end of TTCA's court case to get the FCA and SABL nullified, was obtained on 20-10-2022. However, until the SABL is formally nullified, there is a land tenure conflict between the Tavolo Community and Kakuna-Lote Resource Development Ltd (Kakuna-Lote LOC) and Mekar (PNG) Ltd	10
d)	See description above. With regards the access/use rights of adjacent communities, these are agreed upon in the Tavolo Sustainable Land Use Plan.	5
e)	Not applicable.	0
f)	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	-2

	the Conservation & Environmental Protection Authority (CEPA) has not been processed. Therefore the Tavolo Community has now put their whole SLUP area under a Conservation Deed, which was signed in November 2019.	
g)	Any disputes with other community groups have been resolved with appropriate participatory processes, or areas where disputes remain were excluded from the project area, as is described in the CCB PD, section 2.5.6. Resolving the land tenure conflict with Kakuna-Lote Resource Development Ltd (Kakuna-Lote LOC) and Mekar (PNG) Ltd is the key essential activity of the project. The following project activities are/were undertaken to reclaim i.e. 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 over the Tavolo Sustainable Land Use Plan area null and void. 2) A formal protection status was obtained for the forests in the project area. Tavolo Community has put their whole Sustainable Land Use Plan area under a Conservation Deed. Additionally, Tavolo has submitted an application for the extension of the present Wildlife Management Area (WMA) covering only 2,400ha of their LUIP area, to cover the whole area, with the Conservation & Environmental Protection Authority (CEPA).	-2
Total Land Tenure (LT) [as applicable, ((a or b) + c + d + e + f + g)] Total may not be less than zero.		11

Community Engagement		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	>50% of households are aware of REDD project	0
b)	>20% of households outside PA are aware of REDD project	0
c)	The project generates net positive impacts on the social and economic well-being of the local communities who derive livelihoods from the project area	-5
Total Community Engagement (CE) [where applicable, (a + b + c)] Total may be less than zero.		-5

Political Risk		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Not applicable.	0
b)	A mean governance score of -0.56 was derived for PNG from the mean of Governance Scores across the six indicators of the World Bank Institute's Worldwide Governance Indicators (WGI - https://www.worldagroforestry.org/blog/2012/10/25/the-economics-of-oil-palm-in-indonesia), averaged over the most recent five years (2014-2018) of available data.	4
c)	Not applicable.	0
d)	Not applicable.	0
e)	Not applicable.	0
f)	PNG receives REDD+ Readiness funding from the World Bank Forest Carbon Partnership Facility: PNG FCPF REDD+ Readiness Project Phase 2 United Nations Development Programme (undp.org)	-2
Total Political (PC) [as applicable ((a, b, c, d or e) + f)]		2
Total may not be less than zero.		

External Risk	
Total External Risk (LT + CE + PC)	8
Total may not be less than zero.	

3 NATURAL RISKS

Natural Risk (Fire)	
Significance	Insignificant (less than 5% loss of carbon stocks) or transient (full recovery of lost carbon stocks expected within 10 years of any event).
Likelihood	Even though historical events seem to demonstrate that fire events occur less frequently than 10 years in the project area, we conservatively assume that the likelihood is less than every 10 years

Score (LS)	2
Mitigation	No mitigation measures exists
	Mitigation score: 1,00

Although wildfires are mentioned as an important risk factor to forests in Papua New Guinea¹, most fire events are outside natural forests or (to some extent) along the boundary. Moreover, wildfires are not a common natural phenomenon² Large scale forest fires are almost always associated with (purposefully) clearing of forest. FireWatch PNG (<https://fire.pngsdf.com/>) presents data of fire events (using remote sensing with MODIS, OMI, AIRS and MLS satellite instruments). Figure 1, below depicts all alerts recorded since 2000. As can be seen, the majority of the events take place on mainland PNG and they are almost all located on human inhabited (urban/cultivated) land

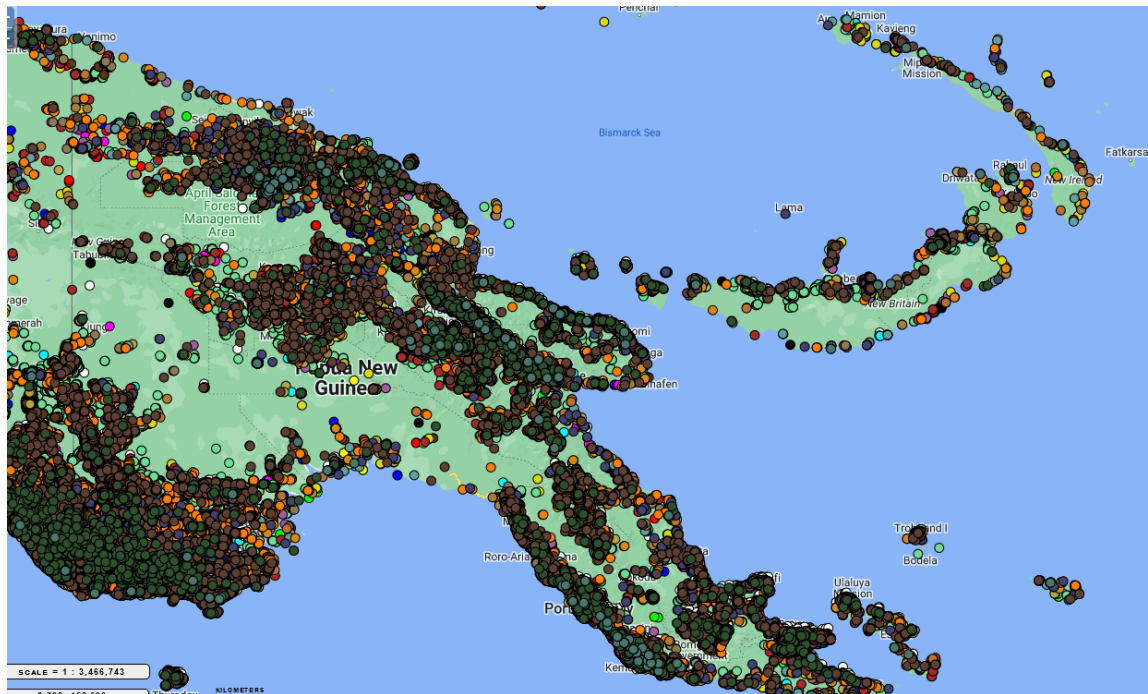


Figure 1. Fire events recorded between 2001 and 2022.

If we zoom in on Tavolo, there are two fire events recorded, both in March 2008 (see Figure 2, below).

¹ GFDDR / ThinkHazard: <https://thinkhazard.org/en/report/192-papua-new-guinea/WF>

²National Biodiversity Strategy and Action Plan (NBSAP) 2019-2024: <https://www.cbd.int/doc/world/pg/pg-nbsap-v2-en.pdf>

Further analysis based on MODIS data of burned areas available from Global Forest Watch showed that from 2001 to 2022, the loss of 6 ha of tree cover was associated with fires.

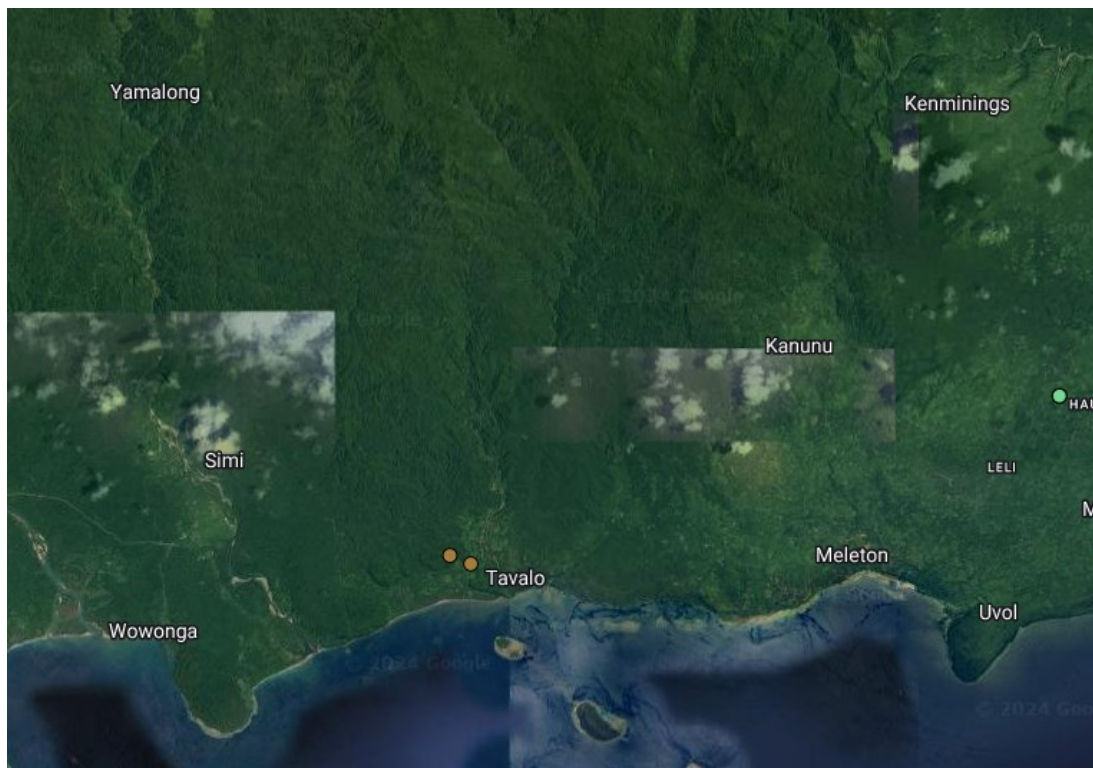


Figure 2. Two fire events (both in March 2008) detected in the project area between 2001 and 2022. Source: WRI/GFW

Specifically in the context of Tavalo, in 1997, a forest fire degraded an area of approximately 1,050 ha of forest in the south-eastern part of the Tavalo land use plan area. The extent of the degradation was relatively limited, and the forest recovered quickly. Other incidents of natural disturbance leading to carbon stock loss haven't been observed since then.

Natural Risk (Pest and Disease outbreaks)	
Significance	no forest loss due to pests & diseases
Likelihood	The likelihood of a pest outbreak in the natural forest is difficult to assess, but pests generally are expected to occur naturally in the forest. There are however no records of large scale pest or disease outbreaks in the forests in and around the project area.
Score (LS)	0
Mitigation	no forest loss due to pests & diseases

No loss is expected from pests and diseases. The natural forest is composed of a mixture of a diverse range of native species, which are adjusted to the site conditions and are resilient to pests and diseases. Although there are many types of pests that occur in the forests of Papua New Guinea³, they predominantly cause problems in (mono-culture) plantations⁴.

Natural Risk (Extreme Weather)	
Significance	no forest loss due to extreme weather
Likelihood	Less than every 10 years.
Score (LS)	0
Mitigation	no forest loss due to extreme weather

Papua New Guinea's Disaster Management Reference Handbook (2022)⁵, provides a hazard map with an overview of the main threats (geological and extreme weather) relevant to Papua New Guinea (Figure 3).

³ <https://odsfm.com/wp-content/uploads/2018/11/chapt6-2.pdf>

⁴ See e.g.: Pestnet: https://www.discoverlife.org/png/OTHER/PNG_DFAT_Insect_pests_in_PNG_Final_11May2016.pdf

⁵ <https://www.cfe-dmha.org/LinkClick.aspx?fileticket=AvmtAYhfkKw%3D&portalid=0>

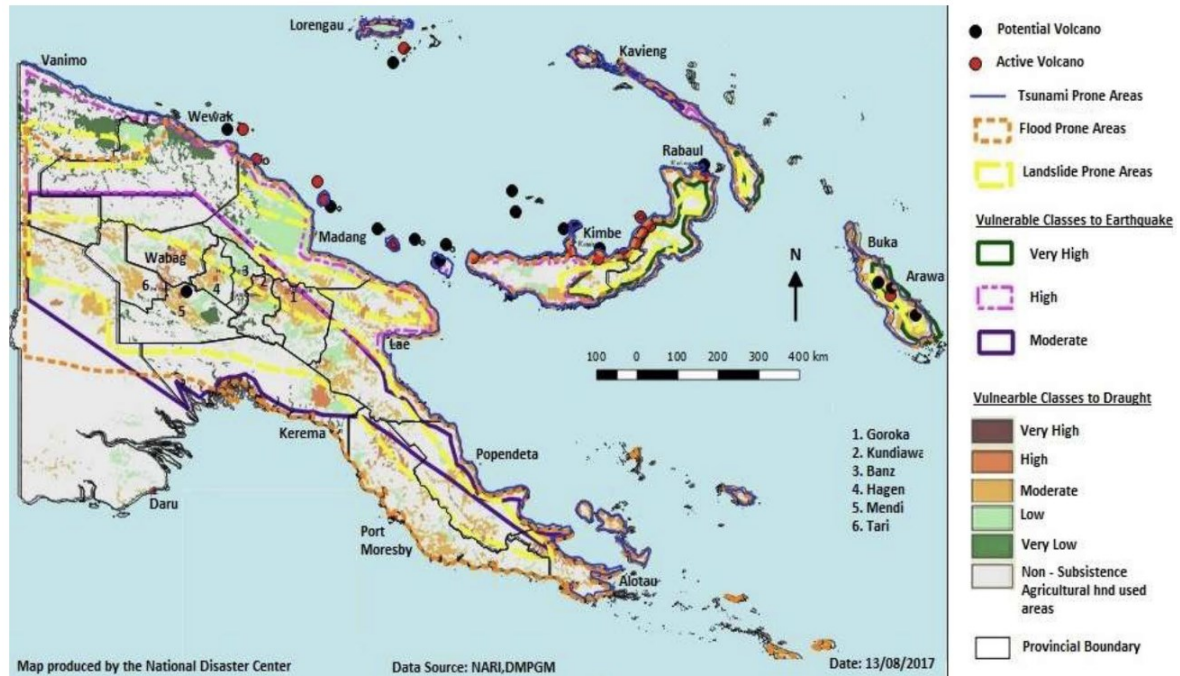


Figure 3. Hazard map PNG. Source: PNG's Disaster Management Reference Handbook (2022)

Extreme heat and dry spells are mentioned as important risks (expected to increase in the future) in Papua New Guinea⁶. The Papua New Guinea's 6th National Report to the Convention on Biological Diversity (2019)⁷, and Climate Risk Profile: Papua New Guinea (2021), indicate the highlands are most vulnerable to temperature rise and extreme heat. The project area is expected to be less affected by extreme heat (also see map).

The intensity of extreme rainfall events appears to be increasing along with temperature, according to the WBG Climate Risk Profile. However, it is mentioned that the phenomenon is highly dependent on local geographical contexts and further research is required to assess the concrete impact in PNG.

Although, with climate change, it is hard to make long-term predictions, contrary to agricultural systems, the natural forests in the project area are expected to not be very vulnerable to current and projected weather extremes, as the forests generally have the capacity to buffer water, acting as a sponge during (high) rainfall, retaining moisture for dry spells. Also, the vegetation and forests in the valleys that may be prone to (flash) flooding are adapted to these conditions as river valleys often flood during the rainy season.

⁶ ThinkHazard: <https://thinkhazard.org/en/report/192-papua-new-guinea/WF>

⁷ <https://www.cbd.int/doc/nr/nr-06/pg-nr-06-en.pdf>

Natural Risk (Geological Risk: Landslides)	
Significance	Insignificant (less than 5% loss of carbon stocks).
Likelihood	Less than every 10 years
Score (LS)	2
Mitigation	No mitigation measures exists. The best mitigation measure is to maintain the natural forest cover which the project is doing Mitigation score: 1,00

Papua New Guinea's Disaster Management Reference Handbook (2022)⁸, provides a hazard map with an overview of the main threats (geological and extreme weather) relevant to Papua New Guinea (see Figure 3, above).

The project is situated in an area that experiences frequent earthquakes due to its location on the complex fault systems of the “Pacific Ring of Fire.” Earthquakes are most likely to trigger landslide events when occurring in combination with heavy rainfall which saturates the soil (WBG Climate Risk Profile report, 2021). It is furthermore mentioned that landslides may also occur directly as a result of extreme rainfall, particularly when ecosystems and soils are in a degraded state. Only areas with steeper slopes are vulnerable to landslides. An FAO report (Forests and landslides - The role of trees and forests in the prevention of landslides and rehabilitation of landslide-affected areas in Asia, 2011⁹) states that on natural slopes, gradients where shallow landslides initiate, are commonly between 15°-25° for earth flows and 20°-45° for debris flows. The report also references an example in India where slopes greater than 20° showed to be the most susceptible to slides, but without woody vegetation, some prediction models suggest that slopes as low as 15° can already fail. The overall consensus is that forests lower the probability of shallow landslides, and to a lesser extent deep-seated movements, in upland areas. Even though landslides can still occur in undisturbed forests, the annual mass erosion rates per hectare are substantially less in forested catchments compared to those where deforestation and forest degradation is severe.

A large part of Tavolo is situated more uphill (with elevations up to 1000 m). Slopes range between 0 and 30°, but mostly vary between 0 and 15° (Figure 4, below). The steepest slopes can be found around the river valleys of Tavolo.

The entire project area is forested and is expected to remain forest for the entire project period. PNG experiences multiple earthquakes on a yearly basis, however not every earthquake results in landslides on vulnerable slopes. That these vulnerable areas are covered with forest is expected to significantly contribute to reducing the likelihood of landslide events. Also current and historical forest/land cover maps/imagery depicting the land cover dynamics over time in

⁸ <https://www.cfe-dmha.org/LinkClick.aspx?fileticket=AvmtAYhfkKw%3D&portalid=0>

⁹ <https://www.fao.org/3/ba0126e/ba0126e00.pdf>

and around the project area, demonstrate that the extent of these landslides that occur in these forested areas (and thus the significance of these events) is small (<5% loss of carbon stocks). It shows that (when disregarding forest disturbances due to anthropological causes) the forest cover in and around the project area is stable with only very minor fluctuations.

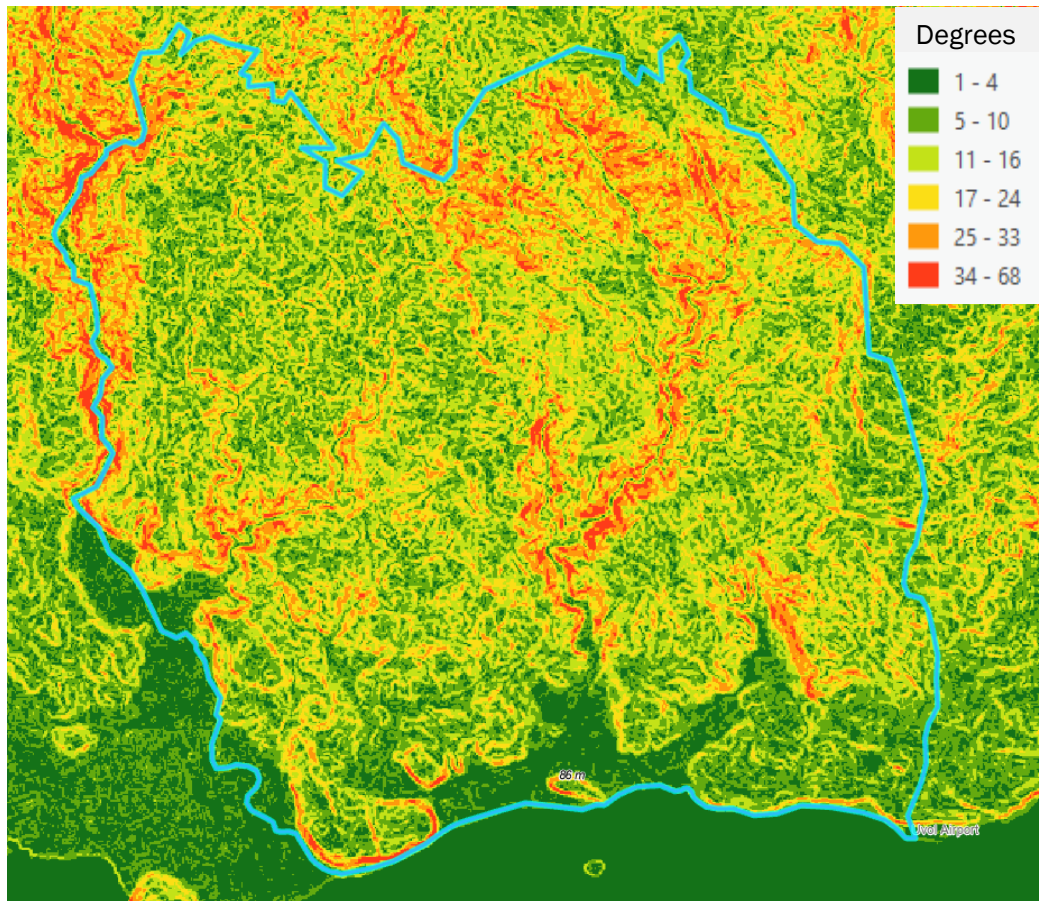


Figure 4. Slopes in project area. Created using ASTER GDEM

Natural Risk (Other geological Risk: Volcanic eruptions)	
Significance	Devastating (50% to less than 70% loss of carbon stocks)
Likelihood	Not applicable to the project area
Score (LS)	0
Mitigation	No mitigation measures exists. The best mitigation measure is to maintain the natural forest cover Mitigation score: 1,00

Papua New Guinea has 19 active volcanoes 34 potentially active and 26 inactive volcanoes. The damage of a volcanic eruption can be devastating, as has also been demonstrated in Mt. Ulawun in November 2023¹⁰, in Papua New Guinea. However, the project area is not situated in the vicinity of a volcano (see hazard map in Figure 3 above). The nearest volcano is > 40 km away. Also, the closest volcanoes on the New Britain island are currently classified as Stage 1- Low activity..

Score for each natural risk applicable to the project (Determined by (LS × M))	
Fire (F)	2.00
Pest and Disease Outbreaks (PD)	0.00
Extreme Weather (W)	0.00
Geological Risk (G)	2.00
Other natural risk (ON)	NA
Total Natural Risk (as applicable, F + PD + W + G + ON)	4.00

4 OVERALL NON-PERMANENCE RISK RATING AND BUFFER DETERMINATION

4.1 Overall Risk Rating

Risk Category	Rating
Internal Risk	5.00
External Risk	8.00
Natural Risk	4.00
Overall Risk Rating (a + b + c)*	17

¹⁰ <https://www.benarnews.org/english/news/pacific/png-volcano-displaces-thousands-11282023053251.html>

* The minimum risk rating is 10, regardless of the risk rating calculated

4.2 Calculation of Total VCUs

See VCS Project Description, the expected calculation of the total VCUs over the project crediting period will be as indicated in Table 1 below.

Table 1 - Number of Verified Carbon Units (VCUs) estimated annually over the project period

Year	Estimated net GHG emission reductions or removals adjusted to account for uncertainty (tCO ₂ e)	Estimated Non-Permanence Risk Buffer (17%) (tCO ₂ e)	Estimated VCUs after risk buffer subtraction (VCUs)
	<i>Adjusted_NER_{REDD}</i>	<i>Buffer_{Total}</i>	<i>VCU_t</i>
2019	-3,321	-	-3,321
2020	467,599	104,885	362,714
2021	491,094	108,803	382,291
2022	365,274	79,334	285,940
2023	133,582	26,547	107,035
2024	181,574	37,101	144,473
2025	74,121	12,721	61,400
2026	74,002	12,701	61,301
2027	73,884	12,680	61,203
2028	73,765	12,660	61,105
2029	73,765	12,660	61,105
2030	50,269	8,627	41,642
2031	26,883	4,614	22,269
2032	11,009	1,889	9,119
2033	7,555	1,297	6,258
2034	1,891	324	1,566
2035	1,891	324	1,566
2036	1,891	324	1,566
2037	1,891	324	1,566

@2038	1,891	324	1,566
2039	1,891	324	1,566
2040	-422	-	-422
2041	-2,724	-	-2,724
2042	-4,287	-	-4,287
2043	-4,627	-	-4,627
2044	-5,184	-	-5,184
2045	-5,184	-	-5,184
2046	-5,184	-	-5,184
2047	-5,184	-	-5,184
2048	-5,184	-	-5,184
Total	2,074,417	438,466	1,635,951