

JCM Project Design Document Form for REDD-plus and Afforestation/Reforestation

A. Project description

A.1. Title and reference number of the project idea note (PIN) of the JCM project

Title	ARR project in Negros Occidental through the planting of native species
PIN reference number	PH_PIN001

A.2. General description of the proposed project

This project aims to undertake reforestation over a 30-year period to contribute to carbon sequestration, watershed restoration, and biodiversity enhancement through the planting of native tree species (such as Narra and Molave) on degraded lands on Negros Island, Philippines. In the Philippines, forest cover, which occupied approximately 70% of the country's land area in the early 1900s, has declined to around 20% as of 2020, making deforestation a critical environmental concern.

The proposed project will implement afforestation / reforestation activities, including site preparation, establishment of native species nurseries, planting of diverse indigenous tree species, enrichment planting in partially degraded areas, and long-term maintenance such as weeding, fertilization, fire prevention, and protection against illegal logging. These activities are expected to enhance carbon removals by increasing aboveground and belowground biomass, improving soil carbon stocks, and preventing further land degradation. Additional co-benefits include improved watershed functions, reduced soil erosion, and strengthened habitat connectivity for native flora and fauna.

The project proponents (PP), Marubeni Corporation will manage the reforestation activities, carbon credit certification process, and oversee overall project management. The local partner, Sirawai Palm and Rubber Corporation (SPRC), a plantation and agricultural company which is a subsidiary of the local conglomerate DACON Corporation, will manage land tenure and legal procedures, coordinate with government authorities, and engage local communities to support implementation and long-term stewardship. The Department of Environment and Natural Resources (DENR) will issue the Sustainable Forest Land Management Agreement (SFLMA), which offers 25-year renewable terms and grants land-use rights that support diverse forest land uses for the project proponent, while University of the Philippines Los Baños (UPLB) will provide scientific and technical guidance on species selection, site

suitability, and reforestation strategies.

Key risks that could substantially affect the project's GHG emission removals include: (i) natural disturbances such as typhoons, droughts, pests, and forest fires that may reduce tree survival and growth rates; (ii) anthropogenic risks such as illegal logging, land-use conversion, or encroachment; (iii) uncertainties in species-site matching that could affect biomass accumulation; and (iv) institutional and community-related risks, including insufficient local engagement or tenure disputes. These risks will be mitigated through climate-resilient species selection, mixed-species planting designs, firebreak establishment, community-based forest protection mechanisms, regular monitoring, and adaptive management practices. To address the risk of potential reversals arising from these factors, the project will apply a 15% buffer, which is determined in line with the JCM guidelines and methodology.

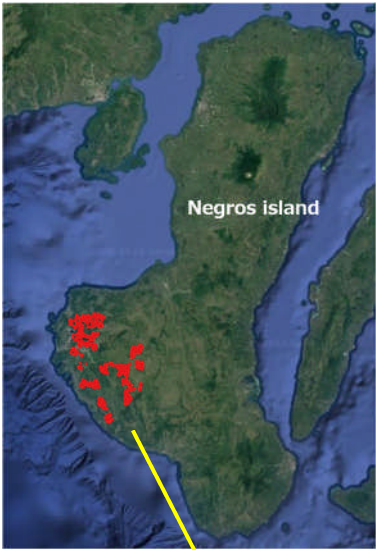
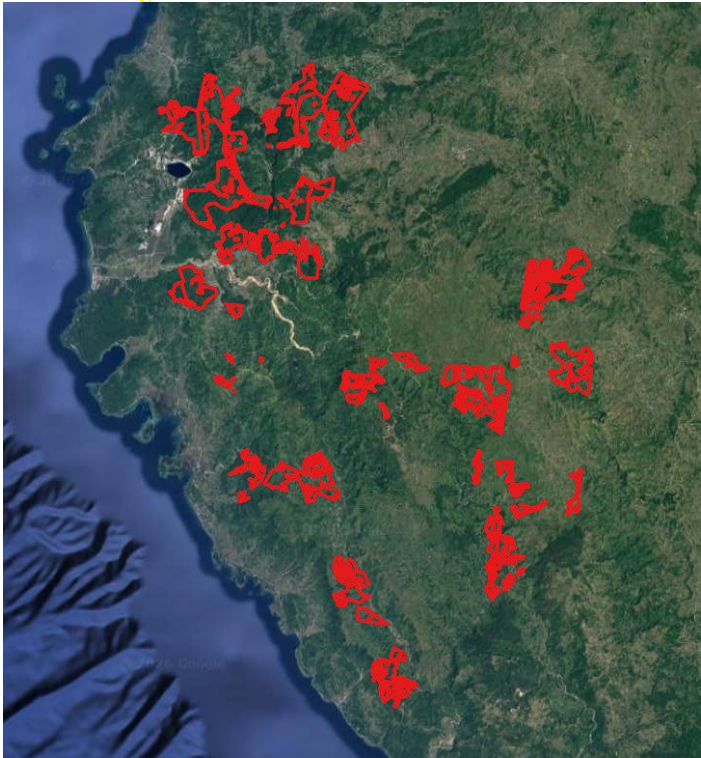
The project area is currently characterized by degraded lands with limited forest cover due to historical deforestation and unsustainable land use. Without the project, these lands are expected to remain under low-productivity conditions or be subject to further degradation. Potential drivers of deforestation and forest degradation in and around the project area include fuelwood collection, agricultural expansion, and weak enforcement of land-use regulations. The project will address these pressures by establishing long-term forest cover, strengthening community engagement, and aligning with national forest protection policies, consistent with the JCM rules and guidelines for forest sector.

A.3. Project location

Country	Republic of the Philippines
Region, province, district, villages, etc.	Province of Negros Occidental
Geographical coordinates	The project is located within latitude 9.4697° N to 9.8885° N and longitude 122.4427° E to 122.7293° E .

A.4. Project area and activity area

Project area

Map	A satellite map of Negros island with the project area highlighted in red. A yellow arrow points from this map to a larger, more detailed map below. □ : Project area A detailed satellite map of the project area, showing various land parcels outlined in red. The area is located on the western side of Negros island.
Total size	12,360ha

Fulfillment of forest definition	Under the applied JCM guideline and methodology, “Forest” is defined as Forest Land spanning more than 0.5 hectares with trees higher than 5 meters and with a canopy cover of more than 10 percent, or trees that are able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use. “Non-forest” is defined as an area which does not meet the definition of forest. Based on this definition, no part of the project area qualifies as Forest; the entire project area is classified as Non-forest, and the project aims to convert non forest area to forest area. .
Forest type and conditions	The project area does not contain any forest. It is dominated by degraded grassland and brushland. Over the past 10 years, no natural tree regeneration or forest succession has been observed, and it is assumed that the forest will not regenerate in the absence of the project. The project therefore aims to convert this non-forest land to forest through active planting.
Environmental conditions	Climate: The project site in Negros Occidental experiences a tropical climate, characterized by relatively high temperatures and significant rainfall throughout the year. The region is vulnerable to climate change and extreme weather events, as the Philippines ranks 4th globally in the Climate Risk Index (2000–2019). These climatic conditions are conducive to forest regeneration and biomass growth, which is essential for carbon sequestration under the ARR approach. Hydrology: The terrain and vegetation suggest seasonal rainfall and runoff influence soil moisture and vegetation patterns. The project areas are upland or sloping, with no mention of standing water or wetland areas. Forest restoration in these areas is expected to enhance water infiltration and reduce surface runoff. Topography: The ARR site spans multiple municipalities and is stratified by elevation into six bands: 100–200 masl, 201–300 masl, 301–400 masl, 401–500 masl, 501–600 masl, and 601–700 masl. The varied topography influences vegetation types and biomass distribution, and appropriate species selection accounts for this elevation gradient. Historic Conditions: Historically, the project area supported natural forest cover, which has been significantly reduced due to logging, agriculture, and settlement expansion. Based on community histories and the UPLB assessment, large-scale forest

	degradation began with the expansion of commercial logging and road construction from the late 1960s to the 1970s, intensified through the 1980s–1990s with kaingin farming (shifting slash-and-burn cultivation practiced on forested slopes), mining, and infrastructure development, and further accelerated in the 2000s with agricultural expansion such as sugarcane production. The remaining land is now primarily brushland and grassland, with limited natural regeneration. Forest cover in the Philippines decreased from 16.9 million hectares in 1934 to 7.2 million hectares in 2020. Soils: Soil sampling was conducted at three depths (0–20 cm, 20–50 cm, and 50–100 cm), and soil organic carbon (SOC) values varied from 11.04 to 16.46 tons/ha. The average SOC across brushlands was 13.73 tons/ha, indicating moderate carbon content. Soil quality is a key factor supporting tree and grass growth in the proposed ARR project. Vegetation: Vegetation in the reference scenario is categorized as brushland and grassland. The brushlands are moderately forested with species such as Mahogany (<i>Swietenia macrophylla</i>), Gmelina (<i>G. arborea</i>), Mangium (<i>Acacia mangium</i>), and native species like <i>Ficus</i> spp. and <i>Macaranga</i> spp. Species diversity is highest in Sipalay (34 species), and lowest in Ilog and Hinoba-an (20 species each). Grasslands are dominated by low-biomass grasses, with carbon content averaging 43.81%. Ecosystem: The ARR sites represent degraded ecosystems transitioning from natural forest to secondary brushland and grassland. These ecosystems exhibit low biomass and carbon density. The project aims to restore ecological functions such as carbon sequestration, biodiversity support, and water regulation. Restoration will enhance the site's role as a carbon sink and improve resilience to climate change.
Rights of use for the project	The joint venture between Marubeni and SPRC is in the process of securing formal tenure rights over the project area through a Sustainable Forest Land-use Management Agreement (SFLMA). The SFLMA application was submitted to DENR in June 2026, and the completion of this tenure rights process is expected to take approximately one year. Historically, the project

	area has been classified as public forest land under the jurisdiction of DENR, with no formal private ownership rights over the land. In order to commence on-the-ground activities in parallel with the SFLMA application, Marubeni and NAFDC concluded a Memorandum of Agreement (MOA) with DENR in June 2025. Under this MOA, DENR has granted the JV the right to use the project area for feasibility studies and field operations, including boundary demarcation, planting, and maintenance over the project area. Accordingly, more than 80% of the project area is currently under the effective control and use of the project, based on this MOA.
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Activity area

Activity area	N/A
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A.5. Project participants

Project participants

Country	Project participants
Philippines	Sirawai Palm and Rubber Corporation (SPRC) Negros Agro-Forestry Development Corporation (NAFDC)
Japan	Marubeni Corporation SPC (to be established)

Project implementation structure

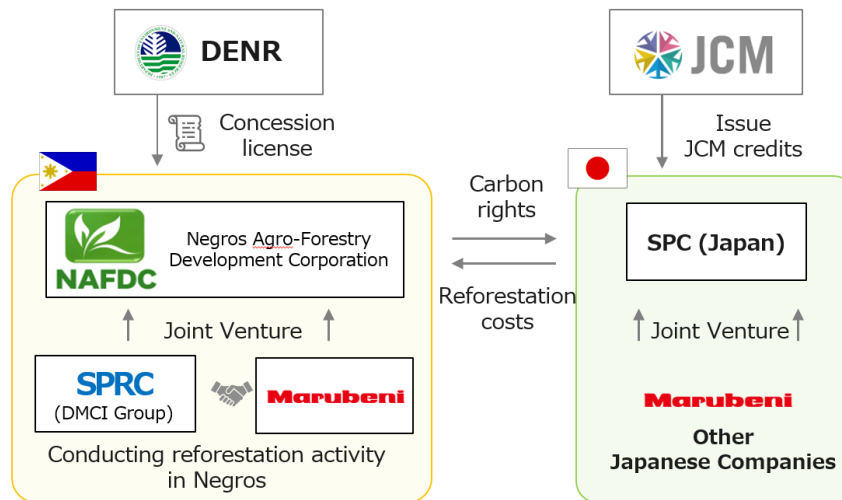
Marubeni has invested in a local company, Negros Agro-Forestry Development Corporation (NAFDC) with its Philippine partner SPRC, a plantation and agricultural company which is a subsidiary of the local conglomerate DAICON Corporation. NAFDC will obtain the necessary land tenure and permits from the Government of the Philippines and carry out all field operations, including planting and maintenance. In operating NAFDC, Marubeni will mainly be responsible for planning and managing plantation operations on the ground, while SPRC will take the lead in liaising with national and local government agencies as well as local communities. In parallel, Marubeni and SPRC are collaborating with UPLB, the country's leading forestry institution.

Under an existing MOU among DENR, DAICON, UPLB, and Marubeni, UPLB has conducted baseline surveys on flora, fauna, species selection, pilot planting, and socio-economic conditions, and will continue to provide technical advice to ensure appropriate species selection, high survival rates, sound safeguards, and the long-term permanence of the forest. Together with DENR's policy oversight and technical guidance, this makes the project the first large-scale reforestation initiative in the Philippines developed through a structured industry-government-academia collaboration.

In addition, IORA Ecological Solutions Pvt. Ltd. (IORA) will support NAFDC in implementing the required monitoring activities (leading the stratification, baseline and sampling design MRV framework, providing technical guidance to NAFDC, and mapping annual forest conversion, loss and burned areas).

At the same time, the project is privately led and must be economically viable. To this end, Marubeni will establish a SPC in Japan to receive and manage the JCM credits on the Japanese side. Several Japanese companies who wish to secure JCM credit offtake for their own

emission offsets under the GX-ETS scheme will participate as equity investors in this SPC. The capital raised in Japan will then be funneled from the SPC to NAFDC and used to finance on-the-ground reforestation activities, which in turn generate the rights to claim emission reductions or removals.. These rights will be purchased by the SPC in Japan, and verified/issued as JCM credits. Those credits will then be purchased by participating Japanese companies to meet their GX-ETS offset obligations, thereby creating a stable revenue stream that underpins the long-term financial sustainability and environmental integrity of the reforestation project.



A.6. Duration

Starting date of project period	05/07/2025
Duration of project period	From 05/07/2025 to 04/07/2067 42 years
Starting date of crediting period (input the information when requesting a renewal of crediting period)	05/07/2025 Renewal of crediting period is planned at 05/07/2040 and 05/07/2055.
Duration of crediting period	From 05/07/2025 to 04/07/2057 32 years (15 + 15 + 2 years)
Duration of observation period	From 05/07/2057 to 04/07/2067 10 years

A.7. Description of drivers of deforestation and/or forest degradation for REDD-plus and project activities

(Only for REDD-plus) Drivers of deforestation and/or forest degradation	NA.
Project activities	NAFDC, a joint venture between Marubeni and SPRC, will conduct afforestation activities on degraded land, using native tree species to restore the forest. The following items will be explained in detail in separate attached documents: tree species selection methods, nursery techniques, transportation and storage of seedlings, land preparation methods, planting methods, management of planting sites, and annual planting area.

A.8. Contribution from Japan

[Financial contribution]

Under our project scheme, the Japanese side will essentially finance the project. The total project cost is estimated at approximately 42 million US dollars, of which around 41 million US dollars, or nearly 98%, will be borne by Japanese companies.

[Technical contribution]

Marubeni will leverage its plantation experience in Indonesia and Australia, managing approximately 287,000 ha of eucalyptus plantations in Sumatra, Indonesia, and about 12,000 ha of plantation and wood-chip operations in Bunbury, Australia, to implement on-site field activities—applying operations management, planting quality control, forest restoration techniques, and fire prevention measures.

[Contribution to natural environment]

This project will address ongoing forest degradation in the Philippines by enhancing carbon storage, biodiversity, and water retention functions.

The Philippines is currently targeting the restoration of 1.5 million hectares of forest under the National Greening Program. This project will contribute by reforesting approximately 12,360 hectares with investment support from Japan.

To ensure the permanence of carbon sequestration beyond the crediting period, the project incorporates several long-term safeguards.

First, the project area will be secured through appropriate land tenure arrangements and agreements with relevant authorities, including DENR, which will continue to regulate and oversee land use in the area. Second, SPRC, as the local implementing partner, will maintain responsibility for site management and protection, including preventing illegal logging, encroachment, and land conversion, beyond the crediting period.

In addition, the project is designed to create sustained economic and social incentives for maintaining forest cover, including community engagement, livelihood support, and potential long-term revenue streams linked to sustainable forest management. These mechanisms are expected to reduce the risk of reversal by aligning local stakeholder interests with forest conservation.

Through these legal, institutional, and socio-economic measures, the project ensures that the forest will be maintained after the termination of the crediting period and will continue to sequester carbon over the long term, rather than reverting to baseline degraded conditions.

[Contribution to local communities]

The majority of project funds will go to local jobs—hiring about 1,000 residents and sourcing seedlings locally—to stimulate the local economy. In total, approximately 45% of total project costs is expected to flow directly to local communities through wages for field work and nursery operations and through local procurement of seedlings and basic inputs. Recruitment will prioritize residents of barangays within the ARR areas in Candoni, Hinoba-an, Ilog, Cauayan and and Sipalay, supported by community meetings where the project and job opportunities are explained face to face.

A.9. Demonstration of economical additionality for afforestation/reforestation project

This project is implemented as an ARR (Afforestation, Reforestation and Revegetation) project and is not undertaken for commercial harvesting. The project proponent hereby declares that no commercial harvesting, commercial timber production will be conducted within the project area during the crediting period.

Since this project will not implement commercial harvesting activities, there is no revenue expected other than credit income. This project condition indicates the need for incentives from credits to ensure project viability. In this regard, Marubeni made a decision and signed an MOU with the DENR, DACON Corporation and UPLB to develop this project on the premise of utilizing carbon crediting scheme. (Source: [Press release by Marubeni on February 10, 2023](#))

B. Application of the approved methodology(ies)

B.1. Methodology(ies) applied to the proposed JCM project

Approved methodology No.	PH_AM005
Version number	Ver01.0
Approved methodology No.	
Version number	
Approved methodology No.	
Version number	

B.2. Explanation of how the project meets eligibility criteria of the approved methodology(ies)

Eligibility criteria	Descriptions specified in the methodology	Explanation of compliance with criterion
Criterion 1	Project area is neither forest nor wetland.	Within the SFLMA concession area, an ARR-eligible area of 12,360 ha was delineated using the 2015 and 2025 NAMRIA land cover maps, consistent with the forest definition in the approved methodology. Agricultural land, existing open forest, areas with forest gain, loss or maintained forest, wetlands (inland water) and built-up areas were excluded. The resulting ARR project area contains only Brush/Shrubs and Grassland classes, and it is neither forest nor wetland.
Criterion 2	The most likely scenario without the project does not show an increase in biomass in the project area. This criterion is demonstrated through observations showing that biomass in the project area has not increased during the past 10 years prior to the start of the project.	Within the SFLMA concession area, an ARR-eligible area of 12,360 ha was delineated using the 2015 and 2025 NAMRIA land cover maps, consistent with the forest definition in the approved methodology. Using the 2025 land cover map (derived from Sentinel-2 imagery at 10-m resolution) clipped to the concession boundary, agricultural land, existing open forest, polygons with forest gain, forest loss or maintained forest between 2015 and 2025, wetlands (inland water) and built-up areas were excluded. The resulting ARR-eligible area consists only of Brush/Shrubs and Grassland classes. To assess biomass change, 500 sample points were allocated within this 12,360 ha ARR-eligible area and NDVI (Normalized Difference Vegetation Index) was calculated from Landsat 8 OLI/TIRS imagery (30 m) for 2015, 2016, 2020, 2023 and 2026 (March scenes with cloud masking). The analysis showed that average NDVI remained within the

		typical shrub/grassland range and that the annual NDVI change over 2016–2026 did not exceed 0.018, indicating no significant increase in biomass over the past 10 years. Thus without any intervention or project that will be implemented in the area, the proposed area will remain as low brush and grassland.
Criterion 3	Project area has not been cleared of forest within the 10-years period prior to the start date of the project.	Past 10 years of satellite data was analyzed to ensure that no land were cleared just for the sake of this project. The 2015 and 2025 NAMRIA land cover maps were compared to identify polygons of forest gain, forest loss and maintained forest within the SFLMA concession area. These forest-change polygons were excluded from the ARR-eligible project area. All land use changes on the ground in the last 10 years are part of normal process of land use change in that area.
Criterion 4	Project activity is not mandated by law nor legal requirements.	The National Greening Program in the Philippines is a national reforestation initiative that should be considered with regard to this requirement. The project area is not covered by the National Greening Program.
Criterion 5	Project activity does not involve site preparation techniques (e.g. digging, stump removal) that cause soil disturbance.	The project does not envisage any soil disturbance as a method of site preparation for the tree planting.
Criterion 6	The project activity is to enhance carbon removals through plantation whose species are approved by the government of the Philippines to plant.	This project plans to plant native species in the Philippines such as Narra and Molave, which showed high growth rate in the pilot planting area. Additional species selection will be continued throughout the project duration. Following the advice from University of the Philippines, we have been considering several additional species such as Red Nato, Dao and

		Agoho.
Criterion 7	Project applies silvicultural systems of conservation forests. Legal or illegal logging to supply commercial timber to regional, national or international timber markets is not carried out in the project area during the project period.	The project applies a conservation-oriented silvicultural system with no timber harvesting for commercial purposes. Seedlings of native species are prepared through purchase from external nurseries and cultivation in our own nursery. These seedlings are planted at 3 m × 3 m spacing after clearing a 1 m-wide strip of competing weeds at each planting point. Weeds are cut back multiple times until the seedlings overtop surrounding vegetation, dead individuals are replanted as needed, and routine fire monitoring and prevention measures are implemented to maintain the conservation forest.

C. Calculation of emission reductions

C.1. Identification of all carbon pools and GHG sources relevant to the JCM project

Carbon pools and GHG sources listed in the applied methodology		Included / excluded (Y/N)	Justification of inclusion or exclusion
Project reference level			
Carbon pools	Aboveground tree biomass	N	This pool would not have increased in the absence of the project. Conservatively excluded.
	Belowground tree biomass	N	This pool would not have increased in the absence of the project. Conservatively excluded.
	Non-tree biomass	N	This pool would not have increased in the absence of the project. Conservatively excluded.
	Dead wood	N	This pool would have decreased in the absence of the project. Conservatively excluded.
	Litter	N	This pool would have decreased in the

			absence of the project. Conservatively excluded.
	Soil organic carbon	N	Soil disturbance is avoided in this methodology.
GHG source	N/A.		N/A.
Project net emissions or removals			
Carbon pools	Aboveground tree biomass	Y	Major carbon pool
	Belowground tree biomass	Y	Major carbon pool
	Non-tree biomass	N	Carbon stock may not increase due to the project activity. Conservatively excluded.
	Dead wood	N	Carbon stock may increase due to the project activity. Conservatively excluded.
	Litter	N	Carbon stock may increase due to the project activity. Conservatively excluded.
	Soil organic carbon	N	Carbon stock may increase due to the project activity. Conservatively excluded.
GHG sources	N2O emissions from fertilizer application		Since nitrogen fertilizer is applied, N2O emissions from fertilizer use are included in the calculation in accordance with the methodology and the PMS.
	CH4 and N2O emissions from burning of biomass (natural cause)		Where natural biomass burning is occurred, CH4 and N2O emissions may be significant sources. Carbon stock decreases due to burning are accounted as tree biomass change. Tree cover loss caused by fire across the five participating municipalities: Sipalay, Candoni, Ilog, Cauayan and Hinoba-An during past 10 years from 2015-2025 was insignificant and it is not reported as a major driver for deforestation in those areas. Fires were responsible for 1.3% of tree cover loss from all other drivers of

		loss in those municipalities between 2014 and 2024. (Source: Dataset from Global Forest Watch)
	CO2 emission from fossil fuel burning	Since fossil fuel is consumed by vehicles used for forest management and reforestation, CO2 emissions from fossil fuel burning are included in the calculation in accordance with the methodology and the PMS.

C.2. Establishment of project reference level

Reference area and period

Map	The reference area is identical to the project area, which is referred to calculating the project reference level. Regarding the map, please refer to the map of the project area on A.4.
Total size	12,360 hectares
Justification	The land cover of the project area is categorized into brush/shrub and grassland, based on the 2015 and 2025 NAMRIA land cover maps (vector land-cover data produced from Sentinel-2 imagery using OBIA; target overall classification accuracy $\geq 85\%$ following Congalton and Green, 2008). According to the study conducted, it was identified that there has been no increase of the biomass in the project area during 10 years prior to the project. Therefore, it is presumed that natural vegetation restoration would not occur based on the historical change of the land cover. Since there is no increase of biomass in the reference area during project period, reference level is set to zero. Carbon pools including dead wood, litter, and soil organic carbon are excluded from the reference level and the project removals to ensure conservativeness of the project net removals.
Period	From 2015 to 2025 10 years

Approach, procedure and data to establish the project reference level

Approach and procedure	Carbon in the proposed area will continue to be the same as based on the GIS analysis of the 2015 and 2025 NAMRIA land cover maps shows that the area historically remained as low brush and grassland for the last 10 years. Thus, based on NDVI analysis at 500 sample points showing values
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	within the shrub/grassland range and annual changes not exceeding 0.018 over 2016–2026, without any intervention or project that will be implemented in the area, the proposed area will remain as low brush and grassland, and the annual biomass increment under the reference scenario is set to zero.
Data	The following datasets and measurements were used to establish the project reference level: • 2015 and 2025 NAMRIA land cover maps for Negros Island Region (vector land-cover data derived from Sentinel-2 Level-2A imagery using OBIA, target overall classification accuracy $\geq 85\%$, PRS'92 projection), clipped to the SFLMA concession boundary to delineate the non-forest project area (12,360 ha). • Landsat 8 OLI/TIRS imagery (30 m spatial resolution, March scenes with cloud masking) for 2015, 2016, 2020, 2023 and 2026, from which NDVI was calculated at 500 sample points within the ARR-eligible area to assess biomass dynamics over the last 10 years, showing average NDVI values within the shrub/grassland range and annual changes not exceeding 0.018, indicating no significant increase in biomass over the past 10 years.
Relationship with national or sub-national reference levels	N/A

C.3. Estimation of project net emissions or removals

Estimation of project net emissions or removals (excluding displaced emissions)

Project net removals in year t , $CR_{PJ,t}$, are estimated using Equation 1. $CR_{PJ,t}$ excluding displaced emissions consists of: (1) Carbon stock change in year t during k th monitoring interval, $\Delta C_{TREE_{PJ,t,k}}$, (2) Loss of carbon stock due to site preparation for tree planting in shrubland and grassland in year t , $C_{LOST,t}$, (3) GHG emissions from biomass burning in year t , $GHG_{BURN,t}$, (4) GHG emissions from fertilizer consumption in year t , $GHG_{FERT,t}$ and (5) GHG emission from fossil fuel use in year t , $GHG_{FUEL,t}$.

(1) Carbon stock change in year t during k th monitoring interval, $\Delta C_{TREE_{PJ,t,k}}$

Carbon stock change in tree biomass is estimated using the stock difference method which estimates the difference in carbon stocks at two points in time. The stratified random sampling

survey is conducted to estimate carbon stock at a given point in time. For the ex-ante estimation of carbon stock change in tree biomass, annual change is estimated based on growth models conservatively representing the project activity.

(2) Loss of carbon stock due to site preparation for tree planting in shrubland and grassland in year t , $C_{LOST,t}$

Loss of carbon stock due to site preparation for tree planting may occur in shrubland and grassland. Tree biomass and nontree biomass present within the project area is considered to be lost as a result of site preparation for afforestation. Carbon stocks in tree biomass and nontree biomass are estimated using the stratified random sampling method.

(3) GHG emissions from biomass burning in year t , $GHG_{BURN,t}$

GHG emissions from biomass burning are calculated based on the amount of aboveground biomass actually combusted, estimated by multiplying the biomass stock per hectare by the burned area and the combustion factor. CH₄ and N₂O emissions are calculated using their respective emission factors.

(4) GHG emissions from fertilizer consumption in year t , $GHG_{FERT,t}$

N₂O emissions from fertilizer application are calculated based on the amount of nitrogen applied through synthetic and organic fertilizers. Direct N₂O emissions from soil are estimated using the relevant emission factor, while indirect N₂O emissions are estimated for nitrogen losses through volatilization and through leaching and runoff.

(5) GHG emission from fossil fuel use in year t , $GHG_{FUEL,t}$

GHG emissions from fossil fuel use are calculated based on the quantity of each fossil fuel consumed. The amount of fuel used is converted to energy consumption using its net calorific value, and the resulting energy consumption is multiplied by the corresponding GHG emission factor to estimate emissions in tCO₂eq.

Project-specific parameters to be fixed ex ante used in estimation of project net removals

Parameters	Description of data	Source of data
CF_{TREE}	Carbon fraction of tree biomass in dry weight basis: - 0.47 [tC/tdm]	2006 IPCC Guidelines Table 4.3 of Ch. 4 Vol. 4
R_{TREE}	Root to shoot ratio of tree: - 0.24 [dimensionless]	2006 IPCC Guidelines Table 4.4 of Ch. 4 Vol. 4
$CF_{NONTREE}$	Carbon fraction of nontree biomass: - 0.47 [tC/tdm]	2006 IPCC Guidelines Table 4.3 of Ch. 4 Vol. 4

NCV _j	Net Calorific Value of fossil fuel use type j: - Gas/Diesel oil: 0.043 [TJ/t] - Motor Gasoline: 0.0443 [TJ/t]	2006 IPCC Guidelines Table 1.2 of Ch. 1 Vol. 2
EF _j	GHG emission from fossil fuel burning type j: - Gas/Diesel oil: 74.1 [tCO ₂ eq/TJ] - Motor Gasoline: 69.3 [tCO ₂ eq/TJ]	2006 IPCC Guidelines Table 3.2.1 of Ch. 3 and Table 2.5 of Ch.2, Vol. 2
EF _{Direct-N}	Emission factor for N ₂ O emission from N inputs by fertilizers: - 0.01 [tN ₂ O-N (tN-input) ⁻¹]	2006 IPCC Guidelines Table 11.1 of Ch. 11 Vol. 4
EF _{Nvolat}	Emission factor for N ₂ O emissions from atmospheric deposition of N on soils and water surfaces: - 0.01 [tN ₂ O-N (t NH ₃ -N and NO _x -N volatilized) ⁻¹]	2006 IPCC Guidelines Table 11.3 of Ch. 11 Vol. 4
EF _{Nleach}	Emission factor for N ₂ O emissions from leaching and runoff: - 0.001 [tN ₂ O-N (t leaching and runoff) ⁻¹]	2006 IPCC Guidelines Table 11.3 of Ch. 11 Vol. 4
Frac _{GASF}	Fraction of all synthetic N added to soils that volatilizes as NH ₃ and NO _x : - 0.1 [dimensionless]	2006 IPCC Guidelines Table 11.3 of Ch. 11 Vol. 4
Frac _{GASM}	Fraction of all organic N added to soils that volatilizes as NH ₃ and NO _x : - 0.2 [dimensionless]	2006 IPCC Guidelines Table 11.3 of Ch. 11 Vol. 4
Frac _{Leach}	Fraction of synthetic or organic N added to soils that is lost through leaching and runoff, in regions where leaching and runoff occurs: - 0.3 [dimensionless]	2006 IPCC Guidelines Table 11.3 of Ch. 11 Vol. 4
GWP _{N₂O}	Global warming potential for N ₂ O: - 265 [tCO ₂ /tN ₂ O]	IPCC Fifth Assessment Report (AR5)
EF _{N₂O}	Emission factor for N ₂ O: - 0.0002 [tN ₂ O/tdm]	2006 IPCC Guidelines Table 2.5 of Ch.2 Vol. 4
GWP _{CH₄}	Global warming potential for CH ₄ : - 28 [tCO ₂ /tCH ₄]	IPCC Fifth Assessment Report (AR5)
EF _{CH₄}	Emission factor for CH ₄ : - 0.0068 [tCH ₄ /tdm]	2006 IPCC Guidelines Table 2.5 of Ch.2 Vol. 4
COMF	Combustion factor: - 0.45 [dimensionless]	2006 IPCC Guidelines Table 2.6 of Ch.2 Vol. 4

Estimation of displaced emissions

Reasons for including / excluding displaced emissions	The proposed project area has not contained agricultural land or forest for the past 10 years; therefore, in line with the methodology, displaced emissions from agricultural activities and wood collection/harvesting are excluded from the assessment and monitoring. By contrast, grazing of livestock may occur within the project area, and thus potential displacement of livestock grazing will be assessed using ex-ante estimation before the initial verification, in line with the methodology.
Ways and means to estimate emissions displacement	For livestock grazing only, displaced emissions will be estimated ex-ante in accordance with the methodology and deducted in the first year (t=1) of the project period. Grazing capacity will be determined by credible estimations or a representative survey.
Total size of displacement belt	N/A
Map of the displacement belt	N/A
Explanation for setting the boundaries of the displacement belt	N/A

C.4. Ex ante estimation of emission reductions or removals

Year	Estimated Project Reference Level (tCO ₂ eq) <i>A</i>	Estimated Project Net Emissions or Removals (tCO ₂ eq) <i>B</i>	Estimated Emission Reductions or removals (tCO ₂ eq) <i>C = A – B</i>
2025	0	-4,970	-4,970
2026	0	-9,858	-9,858
2027	0	-66,220	-66,220
2028	0	-60,220	-60,220
2029	0	-26,626	-26,626
2030	0	46,994	46,994
2031	0	123,744	123,744

2032	0	158,248	158,248
2033	0	199,324	199,324
2034	0	239,636	239,636
2035	0	278,574	278,574
2036	0	317,056	317,056
2037	0	355,865	355,865
2038	0	394,969	394,969
2039	0	434,341	434,341
2040	0	458,422	458,422
2041	0	476,586	476,586
2042	0	403,515	403,515
2043	0	400,220	400,220
2044	0	500,738	500,738
2045	0	589,852	589,852
2046	0	644,384	644,384
2047	0	681,241	681,241
2048	0	718,234	718,234
2049	0	755,357	755,357
2050	0	792,606	792,606
2051	0	829,974	829,974
2052	0	867,457	867,457
2053	0	905,051	905,051
2054	0	942,752	942,752
2055	0	980,556	980,556
2056	0	1,018,540	1,018,540
Total (tCO ₂ e)	0	14,346,342	14,346,342
D. Environmental impact assessment			
Legal requirement of environmental impact assessment for the proposed project		NO	

E. Local stakeholder consultation

E.1. Solicitation of comments from local stakeholders

The Afforestation, Reforestation, and Rehabilitation (ARR) Project undertook an extensive and inclusive stakeholder consultation process to ensure the meaningful participation of local communities, institutions, and relevant stakeholders in the project design and implementation. This process adhered to the principles of transparency, inclusivity, and free, prior, and informed engagement.

Key activities conducted to solicit comments and feedback included:

Livelihood Workshop (October 4, 2023):

This multi-stakeholder event convened representatives from municipal and provincial government units, environmental agencies (PENRO, CENRO), and community organizations. Discussions focused on local land management challenges, existing livelihood activities, and community priorities. The workshop introduced the ARR project concept and gathered initial feedback.

Project Orientation and Focus Group Discussions (January 10–12, 2024):

Municipal- and barangay-level FGDs were conducted across the four participating municipalities—Candoni, Hinoba-an, Ilog, and Sipalay. Participants discussed forest cover changes, current livelihood systems, project risks, perceived benefits, and the community’s willingness to support the ARR project. Stakeholders were asked about potential sources of resistance, and mitigation measures were co-developed with them.

Household Survey (February 16, 2024 – January 7, 2025):

A total of 461 households from 23 barangays were surveyed using structured interviews. The survey assessed local demographics, reliance on forests, income sources, and openness to project participation. Results showed that 98% of respondents were willing to participate in the ARR project.

Barangay-Level FGDs and Validation Workshops (January – July 2024):

Barangay-level FGDs provided space for deeper dialogue on land use, environmental change, and local expectations. Validation workshops (June 4–7 and July 18, 2024) with Local Government Units (LGUs) and the Provincial Government were held to present and refine findings, ensuring alignment with stakeholder views and reinforcing transparency.

Documentation of Stakeholder Inputs:

Stakeholders expressed strong support for the project, highlighting its potential for environmental restoration, improved water availability, disaster resilience, and livelihood opportunities. However, concerns were raised about land tenure security, potential restrictions on resource access, and the need for sustained government and project partner support.

Free, Prior, and Informed Consent (FPIC):

The project site does not overlap with any ancestral domains or areas requiring FPIC under Philippine law. DENR records confirm the absence of existing land tenure instruments within the project boundaries. Nonetheless, customary users were engaged throughout the consultation process to ensure recognition of their land use practices and to foster collaborative arrangements.

Grievance Redress Mechanism:

Local mechanisms for conflict resolution—primarily led by barangay captains and purok leaders—are well established. These will be strengthened under the project to ensure that any grievances related to land use, access, or benefit-sharing are addressed fairly and promptly.

The local stakeholder consultation process confirmed overwhelming community support for the ARR project and provided valuable insights into social, environmental, and economic priorities. Feedback from the consultation has directly informed project design, including the incorporation of sustainable livelihood programs, participatory monitoring, and tailored risk mitigation strategies.

E.2. Summary and consideration of comments received

Stakeholders	Comments received	Consideration of comments received
Barangay officials (Captains, Kagawads, Tanods)	Expressed the need for continued consultation and support in project planning and benefit distribution.	Validation workshops were held with LGUs (Candoni, Hinoba-an, Ilog, Sipalay, and the Provincial Government) to refine results and align with local priorities. Officials are recognized as primary mediators in conflict resolution.

Farmers and upland dwellers	Stressed the importance of including sustainable livelihoods to support forest protection; expressed concern over land use restrictions.	93% of households said sustainable livelihood is essential; This project plans to continuously employ local residents for activities such as nursery operations, transportation, weeding, planting, and monitoring, thereby supporting their livelihoods.
Farmers' associations (e.g., Agboy Farmers Association, Gatuslao Farmers Association, SWISA)	Requested livelihood support and emphasized continued LGU and DENR collaboration.	85% of respondents emphasized the need for continuous support from LGU and DENR. In Candoni and Hinoba-an, community associations were also highlighted as key stakeholders. This project will maintain regular communication with both local and national government agencies as well as associations and implement the project with their support.
Residents in upland and remote sitios	Raised concerns on poor access to health services, roads, and waste management; felt at risk from flooding and typhoons.	Issues were highlighted in the Capstone and Risk Assessments (e.g., Ilog has only 76% healthcare access; many rely on creeks/rivers for water); risks like typhoons and flooding were acknowledged, with reforestation as a mitigation.
Women and marginalized groups	No explicit comments in FGDs, but risk of exclusion from project benefits was noted.	Women and other marginalized groups should also be ensured inclusive participation. In this project, no local residents eligible for employment will be discriminated against, and job opportunities at project sites will be allocated with due consideration for work safety and suitability for each individual.
Barangays Cabadiangan, Mambaroto (Sipalay); Poblacion East, Payauan (Candoni);	Lack of clear understanding of the ARR Project and its benefits	Conducted transparent consultations, household surveys, FGDs, and validation workshops; recommended awareness campaigns and training on carbon markets. This project will continue to raise awareness of the project's objectives and the benefits generated by forest restoration.

Sangke, Bacuyangan, Asia (Hinoba-an); Pinggot (Ilog)		
Barangays Cabadiangan, Nabulao (Sipalay); Payauan, Agboy (Candoni); Pinggot (Ilog)	Concerns about fairness in distributing project benefits, particularly regarding land claimants	This project will also communicate the project's objectives and benefits to land claimants, seek to reach an amicable settlement, and provide them with equal employment opportunities.
Barangays Cabadiangan (Sipalay); Poblacion East, Agboy (Candoni); Damutan, Sangke (Hinoba-an); Pinggot (Ilog)	Poor road infrastructure limits community engagement	As road conditions also affect the implementation of plantation activities, the project will seek the cooperation of LGUs and request infrastructure improvements.
Barangays Mambaroto, Nabulao (Sipalay); Agboy, Payauan (Candoni); Damutan, Sangke, Asia (Hinoba-an); Pinggot (Ilog)	Limited alternative income opportunities due to land use changes	This project plans to continuously employ local residents for activities such as nursery operations, transportation, weeding, planting, and monitoring, thereby supporting their livelihoods.
Barangays Mambaroto, Manlucahoc (Sipalay); Caningay, Poblacion East (Candoni); Bacuyangan,	Unstable livelihood conditions from reliance on mining, farming, sugarcane	This project plans to continuously employ local residents for activities such as nursery operations, transportation, weeding, planting, and monitoring, thereby supporting their livelihoods.

Culipapa (Hinoba-an); Pinggot (Ilog)		
Barangays Nabulao (Sipalay); Cabilia-an, Caningay (Candoni); Bacuyangan (Hinoba-an); Pinggot (Ilog)	Potential low wages and poor income for ARR workers	The project will strictly comply with the locally established wage system and, if work is conducted on holidays, provide additional allowances accordingly.
Barangays Nabulao (Sipalay); Agboy, Cabilia-an (Candoni); San Rafael, Pook (Hinoba-an); Pinggot (Ilog)	Risk of exclusion of landless or marginalized groups from project benefits	In this project, no local residents eligible for employment will be discriminated against, and job opportunities at project sites will be allocated with due consideration for work safety and suitability for each individual.
Barangays Mambaroto, Manlucahoc (Sipalay); Payauan (Candoni); Bulwangan, Sangke (Hinoba-an); Pinggot (Ilog)	Concerns about displacement of informal land users	The project will aim for an amicable settlement primarily through the creation of opportunities such as employment, without any forced evictions.

F. Description of Deviation

N/A.

G. References

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Attachment

Land Cover Analysis - NegrosOccidental

MOU_2026 March 7

MOA_2025 June 2

Draft SOP_NAFDC

Revision history of PDD

Version	Date	Contents revised
1.0	14/9/2026	Initial version