ALIGNMENT ASSESSMENT

JJCL-001-MEX-15102024 ALVARADO, VERACRUZ DE IGNACIO DE LA LLAVE, MÉXICO
Proyecto Pájaro
Juan José Cervantes Lara

October 28, 2024

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ALIGNMENT ASSESSMENT FOR THE PROJECT SUBMITTED BY JUAN JOSÉ CERVANTES LARA, "PROYECTO PÁJARO", WITH AOCP IDENTIFIER JJCL-001-MEX-15102024 ALVARADO, VERACRUZ DE IGNACIO DE LA LLAVE, MÉXICO

CONTEXT

As part of the process for the certification of nature-positive projects and the consequent issuance of Verified Nature-Positive Credits (VNPCs) under the ASES on-chain protocol, the Project developer "Juan Jose Cervantes Lara" submitted the project "Proyecto Pajaro" in Veracruz de Ignacio de la Llave, Mexico. This Project activity is in the onboarding stage with the aOCP identification code **JJCL-001-MEX-15102024 ALVARADO, VERACRUZ DE IGNACIO DE LA LLAVE, MEXICO** and has been implemented from August 27th, 2023. Compliance with the principles, values, standards and requirements of the aOCP is a fundamental requirement to participate in the program. This evaluation takes place during the onboarding phase, prior to the registration of the project activities, as stipulated in the aOCP Procedures document, which describes all the stages that a Project goes through from its inception to the issuance, sale and purchase.

Since Project activities have been implemented before the start of the onboarding process, it participates as a project of Modality B. According to the *aOCP Procedures* document, Modality B projects shall go through the following process be registered:

1. Application via the Project Submission Form (PSF), done by Project proponent.
2. Documentation review and alignment assessment, done by aOCP Operations Team.
3. Payment of onboarding fee by the project proponent.
4. Project pre-registration, done by aOCP Operations Team.
5. On- site Validate of the implemented Project activities, done by aOCP Operations Team.
6. Elaboration of Baseline report, Monitoring plan, Contingent table of credits issuance, done by aOCP Operations Team.
7. Project proponent agreement.
8. Project Verification by an external, independent, 3rd-party Verifier, delivering a Project Verification Report.
9. Project registration letter and first credits issuance, done by aOCP Operations Team.

This report corresponds to step 2, alignment assessment. The methodology and data gathered on-site are presented here.

ALIGNMENT ASSESSMENT

The aOCP is founded on robust principles aimed at ensuring that Project activities seeking registration and accreditation with Verified Nature Positive Credits (VNPCs) demonstrably and positively impact ecosystems in a real, measurable, permanent and additional manner, while avoiding any harm to ecosystems and/or society.

Conformity with the aOCP's principles, values, rules, and requirements is a fundamental prerequisite for participation in the program. This evaluation occurs during the onboarding phase, prior to the registration of Project activities. This mandate is stipulated in the *aOCP Procedures* document, which outlines all the stages a Project undergoes from its inception to the issuance, trading, and retirement of VNPCs.

A positive result of the alignment assessment with aOCP's principles, values, rules, and requirements confirms that the proposed Project activity:

1. Falls into one of the following project types:
   a. Forest management, including Afforestation, Reforestation, and Revegetation (ARR)
   b. Regenerative agriculture
   c. Silvopastoral management
   d. Urban forests / individual tree climate action
   e. Biochar
2. Adheres to the environmental and social no-harm prerequisites,
3. Is anticipated to yield positive impacts on biodiversity,
4. The Project was developed less than 5 years ago;
5. Conforms to the additionality criteria for the requested VNPCs,
6. Possesses documentation substantiating land ownership or an agreement for the project's duration,
7. The Project area has not been degraded, deforested or burned in the last 24 months;

8. For Projects requesting *Biodiversity Credits for Species Conservation,* a positive alignment assessment also confirms that the proposed Project area has a high conservation value due to its commendable state of preservation.

9. Areas where the Mean Species Abundance indicator (also reported as Biodiversity intactness) is lower than 0.80, indicating that biodiversity is at risk and requires restoration action are eligible for Biodiversity restoration credits.

10. The Key species for biodiversity conservation reported by the Project proponent, are recognized as Key species according to the criteria established in the *aOCP Methodology for biodiversity assessment for species conservation V1.0.*

Certain circumstances may result in an unfavorable assessment and, if not rectified or clarified satisfactorily, could lead to the rejection of the Project activity's registration within the aOCP.

These circumstances include:

- Non-compliance with aOCP's principles, values, rules, and requirements,
- Issuance of contradictory and/or false declarations by the Project proponent or Project developer,
- Diminished confidence in the Project activity's ability to yield anticipated ecosystem and/or social benefits due to an inadequate risk management plan, which encompasses a comprehensive assessment of internal, external, and natural risks, as well as risk mitigation and contingency planning.

According to the information provided by the Project proponent in the Project Submission Form (PSF), the proposed Project activity belongs to the aOCP category of *Urban Forest/Plantation-based Climate Action*. This project implements a variety of activities focused on environmental restoration, and sustainable land management. Over the past decade, the project site has undergone significant ecological restoration efforts to restore its original mangrove habitat. Historically a mangrove forest, the area was partially converted for productive use, which altered its natural land cover and ecosystem function. Since 2018, a restoration agreement with the National Forestry Commission, under the Environmental Compensation Program, has enabled the reforestation of 80 hectares with native mangrove species, *Laguncularia racemosa* and *Avicenia germinans*. These restoration efforts, carried out consistently from 2018 through 2022, employed diverse techniques to enhance soil structure, increase vegetation cover, and gradually reduce

invasive *Spartina spartinae*, creating favorable conditions for wildlife and benefiting the local community.

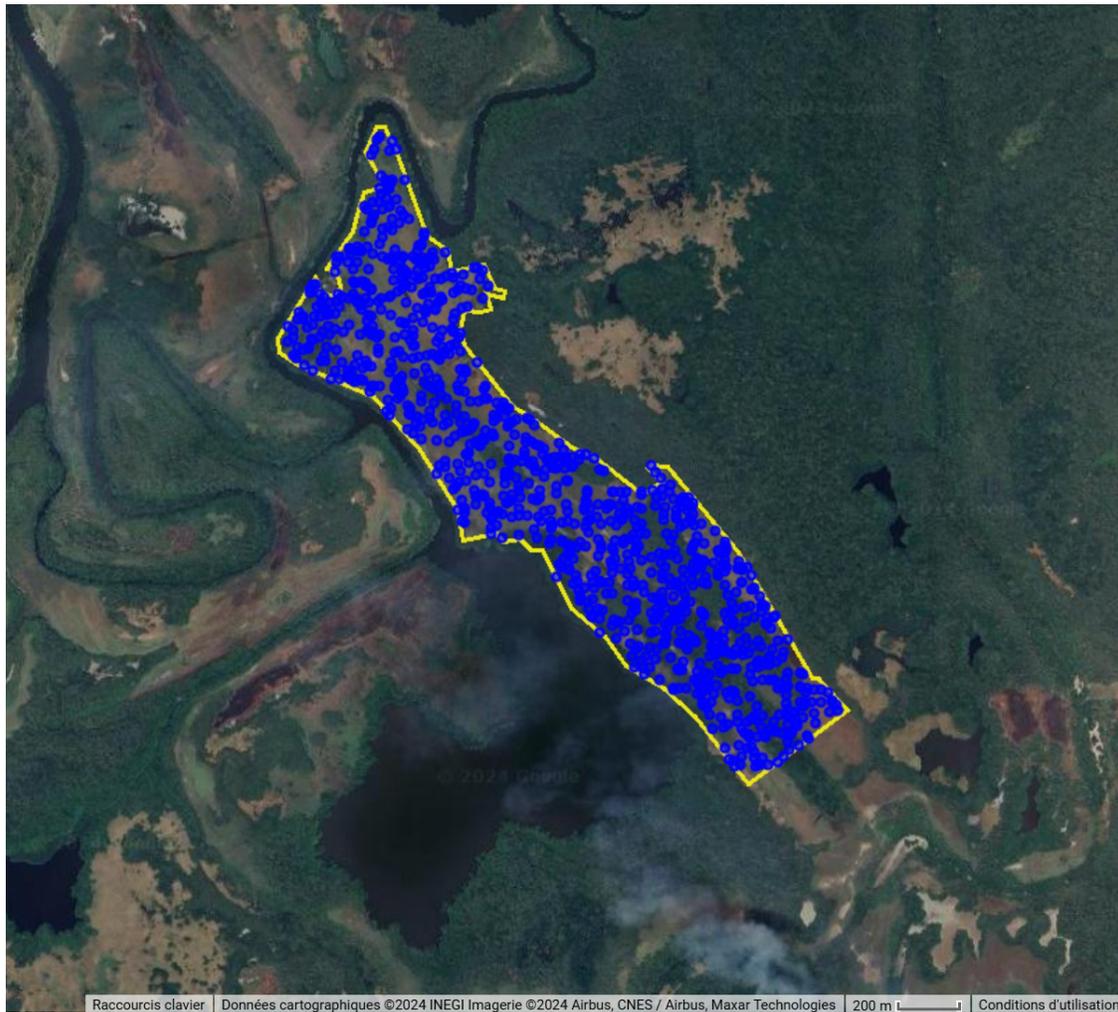The Project area and sampling points used for the present analysis are shown in figure 1.

Figure 1. Project area and sampling points used for the NDVI analysis.

METHOD OF ANALYSIS

The proposed Project activity was assessed for its alignment with the aOCP rules and requirements, using the following checklist.

Alignment criteria	Y: yes N: no P: partially N.A.: not applicable	Comments
Does the project belong to one of the following types: • Forest management, including ARR • Regenerative agriculture • Silvopastoral management • Urban forests / individual climate action • Biochar	Y	
Does the project comply with the environmental and social no-harm requirement?	Y	
Is the project expected to have positive impacts on biodiversity?	Y	
If the project has already started, is it less than 5 years old?	N	
Do the requested VNPCs comply with the additionality criteria?		
Has documentation establishing land ownership or an agreement for the project's duration been provided?	Y	
Have any trees or shrubs been cleared in the project area in the last 2 years?	N	
For biodiversity restoration credits, Biodiversity intactness indicator is < 80%	N.A	
For biodiversity conservation credits, Biodiversity intactness indicator is > 80%	Y	
Are the proposed key species aligned with the aOCP criteria for key species?	Y	

Historical land cover dynamics was analyzed using Google Earth high-resolution images as well as NDVI (Normalized Difference Vegetation Index) analysis. The NDVI is a widely used remote sensing metric that provides information about the density and health of vegetation in a specific area. It is calculated from the difference between near-infrared and red light reflectance from the Earth's surface.

When analyzing historic land cover, NDVI can be used to track changes in vegetation over time. By examining archived NDVI data, it is possible to observe trends in vegetation density, identify shifts in land use patterns, and monitor the effects of factors like urbanization, deforestation, or natural disasters.

NDVI provides information on the quantity and quality of vegetation in a given area. It varies from -1 to +1, where values closer to +1 indicate dense and healthy vegetation, while values close to -1 suggest a lack of vegetation or presence of artificial surfaces.

In Google Earth Engine, the maximum monthly NDVI from January 2019 to July 2024 was calculated using Sentinel-2 satellite imagery. Random control points were then plotted in each property (Figure 1) and the monthly NDVI value at each point was extracted.

Google Colab was used to generate a box plot showing the distribution of NDVI values at the control points. A box plot is a standardized way of displaying the distribution of a data set based on its summary of five numbers of data points: the "minimum", the first quartile [Q1], the median, the third quartile [Q3], and the "maximum". Box plots provide information on outliers, symmetry of the data, degree of clustering, and whether and how the data are skewed[1].

Biodiversity intactness quantifies the impact humans have had on the intactness of species communities. Anthropogenic pressures such as land use conversion cause dramatic changes to the composition of species communities and this layer illustrates these changes by focusing on the impact of forest change on biodiversity intactness[2]. This information was assessed via the Orbify platform.

RESULTS

Analysis of Google Earth imagery (Figure 2) provides a clear depiction of changes in vegetation cover within the project area from 2018 to 2024. In 2018, prior to project implementation, significant portions of the area were characterized by bare soil, indicating limited vegetation presence. By 2024, substantial vegetation growth is visible across these previously barren

[1] Galarnyk, M. Understanding Boxplots. https://builtin.com/data-science/boxplot

[2] Hill, S. L., Arnell, A., Maney, C., Butchart, S. H., Hilton-Taylor, C., Ciciarelli, C., ... & Burgess, N. D. (2019). Measuring forest biodiversity status and changes globally. Frontiers in Forests and Global Change, 2, 70.

sections, with the most notable increase observed in the southwestern region of the project polygon. This pattern suggests successful vegetation recovery and establishment in areas that initially lacked plant cover, highlighting the positive impact of restoration activities over the assessment period.
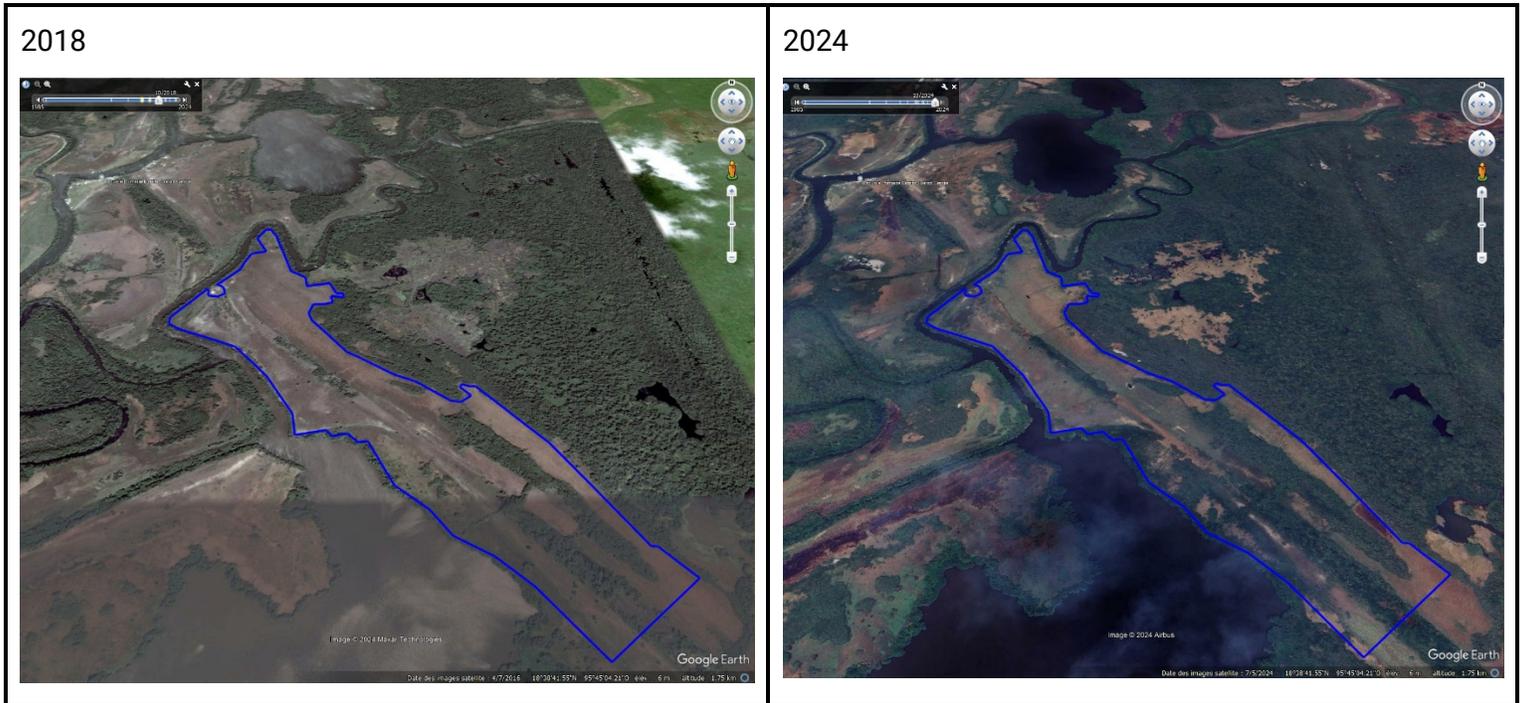

Figure 2. Google Earth images of the Project area from 2018 and 2024.

The analysis of NDVI in Figure 3 illustrates a spectrum closely correlated with rainfall distribution. During periods of increased rainfall, there is a noticeable rise in NDVI values. This pattern typically reflects seasonal variations in vegetation dynamics within the region. Throughout the observed years, the average NDVI value remains around 0.6 for most periods, indicating moderate vegetation density and cover. However, some individual sampling points show NDVI values of -0.2 to 0, indicating bare soil conditions. A closer examination of the annual mobile average reveals a gradual upward trend, beginning at 0.61 in January 2020 and rising to 0.71 by June 2024. This progression suggests a steady increase in vegetation density over time, likely due to natural regeneration or restoration efforts within the area. Notably, there is no sharp decline in NDVI values, which would typically signal deforestation or significant vegetation loss. Instead, the consistent upward trend in the annual moving average, as illustrated in Figure 3, reflects a gradual and sustained improvement in vegetation health across the evaluation period.

NDVI TIMELINE IN "ALVARADO, VERACRUZ DE IGNACIO DE LA LLAVE, MEXICO" PROJECT AREA. N=1010
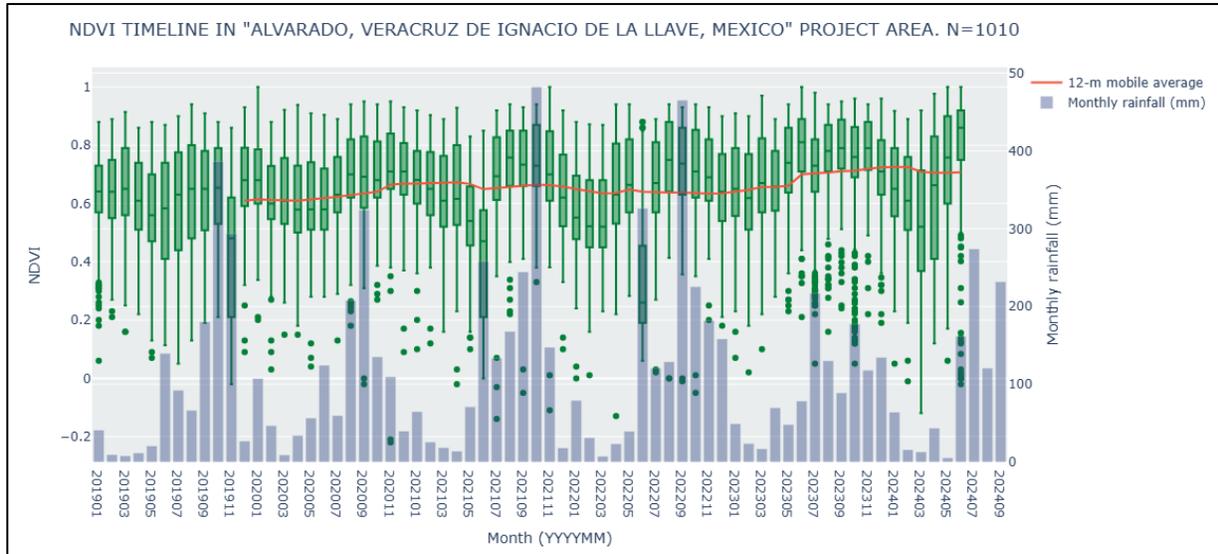
Figure 3. Monthly NDVI and rainfall since January 2019.

Biodiversity intactness has been stable since 2017, with an average value of 92.98% (figure 4). This value is aligned with biodiversity conservation objectives. More detailed information on the ecological status of the project area and its risks can be consulted in the *Preliminary assessment* document.
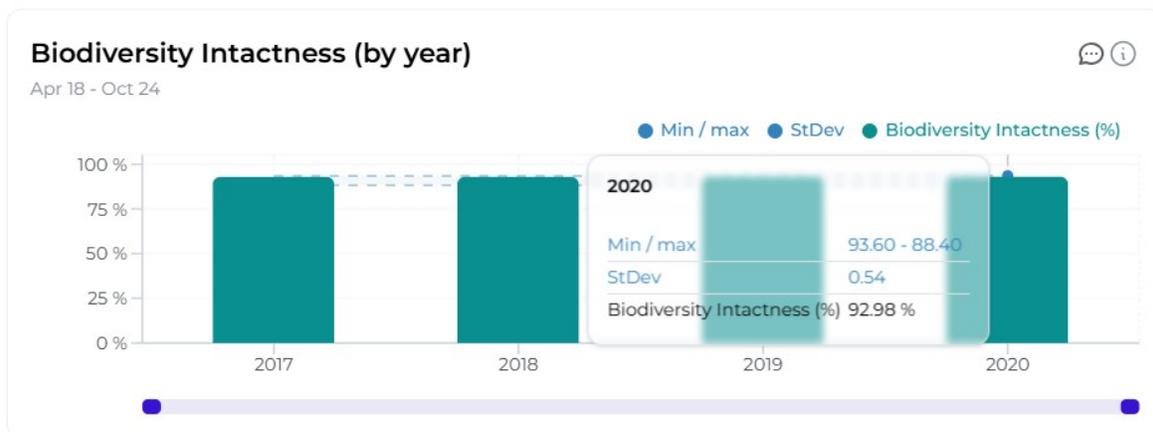

Figure 4. Biodiversity intactness.

The project is centered on restoring the original mangrove ecosystem through targeted reforestation and ecological restoration efforts to rehabilitate degraded lands and enhance biodiversity. These efforts aim to improve soil structure, reduce invasive species, and create habitats that support carbon sequestration and benefit local communities both ecologically and economically. These planned activities are a significant step forward in managing forestry and biodiversity within the project area. Additionally, they offer essential environmental benefits to the local community, contributing to the preservation of natural resources and the enhancement of local wildlife habitats. Some of the species are considered key because they are endemic or in some category of risk, and their potential distribution according to bibliographic information covers the project area, these are presented in Table 1.

Table 1. Key species with potential distribution

Class	Scientific Name	Common Name	National Status*	World status*	Distribution Mexico
Fauna					
Aves	*Busarellus nigricollis*	Black-collared Hawk	Pr	LC	*
Aves	*Eupsittula nana*	Olive-throated Parakeet	Pr	NT	Native
Aves	*Aramus guarauna*	Limpkin	A	LC	*
Aves	*Mycteria americana*	Wood Stork	Pr	LC	*
Aves	*Buteogallus urubitinga*	Great Black Hawk	Pr	LC	*
Aves	*Sturnella magna*	Eastern Meadowlark	*	NT	*
Aves	*Amazona albifrons*	White-fronted Parrot	Pr	LC	Native
Amphibia	*Rhinophrynus dorsalis*	Mexican Burrowing Toad	Pr	LC	*
Reptilia	*Kinosternon scorpioides*	Scorpion Mud Turtle	Pr	*	*
Flora					

Magnoliopsida	*Rhizophora mangle*	Red Mangrove	A	LC	Native
Magnoliopsida	*Okenia hypogaea*	Burrowing Four-o'Clock	*	VU	Native
Magnoliopsida	*Citharexylum ellipticum*	*	*	VU	Endemic

National status NOM-059-SEMARNAT-2010: (E) Probably extinct in the wild, (P) Endangered, (A) Threatened, (Pr) Subject to special protection, (NA) Not applicable.

Global status IUCN Red List: (E) Extinct, (EW) Extinct in the wild, Collapsed, (CR) Critically Endangered, (EN) Endangered, (VU) Vulnerable, (NT) Near Threatened, (LC) Least Concern, (DD) Data Deficient, (NE) Not Evaluated.

The implementation of sustainable forestry practices and reforestation efforts will enhance ecosystem restoration and the conservation of local biodiversity and key species within this region.

CONCLUSIONS

- The Project area has a biodiversity intactness of 92.98%, which is aligned with biodiversity conservation objectives.
- The proposed Project activities have the potential to contribute to the restoration of biodiversity and the improvement of soil conditions, with positive consequences for water infiltration.
- The potential distribution of at least 9 species of fauna and 3 species of flora, in some category of risk and/or endemic, highlights the importance of biodiversity restoration activities in the project area.
- The implementation of sustainable forestry practices and reforestation efforts to enhance restoration of local biodiversity and key species within this region are aligned with the aOCP rules and requirements and are therefore, eligible to be registered as an aOCP Modality B, Forest management project.
- The project implementation was carried out in August 2023, which meets the requirement of projects not more than 5 years old at the time this alignment assessment is carried out. Additionally, satellite assessment reveals the project area has not been cleared in the past two years.
- The alignment of the proposed Project activities to the aOCP is conditioned to the assessment of the following documentation, which we kindly request the Project proponent to provide:
  o Total number of trees planted and the number of individuals of each species.

- Upon positive assessment, the Project may proceed unto the next steps of assessment for Carbon Removal (VCC). To accurately assess the expected ecological benefits, we require the following additional information:
  - Clear geolocation of areas where ecosystem restoration planting has been carried out.