

## **Carbon Assessment**

### **ADDITIONALITY**

*Has the project created a net-positive carbon impact that would not have occurred without the incentive created by carbon credit revenues?*

- The project has higher costs and lower revenue than the baseline scenario: Forest adaptation leads to increased costs due to more complex forest management procedures, earlier and increased introduction of various tree species, and intensified hunting.
- Additionally, the trees are harvested earlier than in the baseline, resulting in less valuable wood products for sale (lower profitability).
- Given the lower profitability in the project scenario, the project would not have been carried out without additional funding.
- Some public funding exists, but these programs don't sufficiently cover the cost of the project to overcome the financial barrier:
- A recently launched public subsidy to support climate-resilient forest management (Förderprogramm Klimaangepasstes Waldmanagement, [1]) provides funds in the range of maximum 100 €/ha/year; the total costs of forest adaptation from monocultures into mixed, climate-resilient forests are in the range of 7-10k€ per hectare [2]. Even if a forest owner would be eligible for the maximum amount of funding over a duration of 10 resp. 20 years (program limit), these aggregated funds (1-2k€) would not even cover a quarter of the associated costs.
- The project owner has contractually assured that they have not been rejected by or participated in any GHG project in the past and also that the GHG project will not be submitted to any other GHG program during the project period.

### **PERMANENCE**

*Is the carbon likely to remain stored in the long-term?*

- Based on the AFOLU (Agriculture, Forestry, and Other Land Use) Non-Permanence Risk Tool from VCS, the following list of impermanence risks are considered for the GHG projects:
  - Internal risks: project management, financial, opportunity cost, and project longevity risks
  - External risks: land ownership, resource access, community involvement, and political risks
  - Natural risks: events like storms, bark beetles, or fires
- For a detailed risk mitigation strategy, see PDD, chapter 3.7. Most important mitigation measures: qualified forest managers, legal contracts, buffer reserves
- For all GHG projects certified by Pina Technologies GmbH a risk buffer is deducted
- The buffer serves as insurance for unavoidable losses in projects and ensures the permanence of GHG emission reductions
- There is a process to cancel and replace credits
- The buffer pool is managed across all projects by Pina Technologies GmbH
- The project owner holds both ownership and resource access rights
- The project owner is contractually committed to implementing adaptation measures
- Contract eliminates potential conflicts over ownership and use of the project area
- Managing the forest throughout the duration of the project in a way, that it develops healthy stands with a strong growth, is in the own interest of the landowner, as it raises long-term profitability and stability of the managed forest
- Carbon credit revenues provide financial support to continue the project
- There is a legal responsibility to continue the contract (otherwise landowners are obligated to pay back project funds)
- Germany is supportive of carbon projects and carbon finance.
- The German Environment Agency states, that "There is an urgent need to scale up climate change mitigation action. This global challenge offers an important opportunity for the voluntary

carbon market to contribute to the flow of climate finance.” ([Climate Change 44/2020](#))

- The risk buffer ensures the permanence of GHG emission reductions after the project period
- Qualified forest managers are committed to implementing adaptation measures, ensuring long-term carbon storage
- There is an intrinsic motivation of forest owners to keep their forest in a thriving state, as this ensures long-term income. Drastic measures, like clear-cutting the forest after the project duration, are forbidden by law and therefore highly unlikely
- A more robust forest inherently stores more carbon compared to a monoculture

## **BASELINE**

*Is carbon accounting based on clear, justified expectations and modelling?*

- Several options have been weighed to determine the most conservative baseline approach for the project type forest adaptation: Using historical stock data from the area or using old forest management plans cannot be considered representative, as the forestry sector in Germany is in a constant state of change (due to price changes on the timber market, climatic changes, ...). Using the minimum harvesting practices that are defined by law should not be assumed for conservative reasons, as the minimum is usually exceeded in practice. Timber stocks will decrease in both scenarios, therefore a comparison with forest stocks on similar areas is not useful in an ex ante calculation of climate performance. Therefore, the forest adaptation methodology uses the approach of "common practice modeling."
- As a general assumption for the baseline scenario, valid for all forest adaptation projects, the forest continues to be managed within the scope of a commercially optimized forest. The parameters used to describe this scenario are based on scientific sources (see PDD) and public data (National Forest Inventory, updated every 10 years).
- Baseline considerations are refined reflecting state-level regulations: e.g. for the case of project Luckaitztal, the baseline takes into account current forestry practices in Brandenburg, including clear-cutting prohibitions and single tree removal (§10, LwaldG).
- Hence, the reference area to determine "common practice" is Germany, considering state-level differences, and the underlying data is a nation-wide forest survey updated every 10 years
- In a conservative approach, the "common practice" model has been chosen (see above)
- The GHG project is based on high-quality input data from the National Forest Inventory with a sampling error of 7.83%, which is significantly below the 10% threshold suggested by UNFCCC (2015).
- Relevant parameters for calculating the baseline are a) the average density of forests in the state (determining the carbon stock) and b) the measures used to manage the forest. For a), data from the National Forest Inventory is used. For b), parameters like for example target diameters for individual tree species, are taken from scientific sources
- Calculations are carried out using TreeGrOSS, a recognized statistical tree growth model in Germany
- The baseline represents a historical trend for land use in the project area, in the sense that the forest is assumed to be managed in the same way as it used to be (mono-culture stands, often of one single age class, maximum timber turnover, maximum stand density..) in the particular State in Germany
- Use of technology is the same in both baseline and project scenario and assumes common practice in Germany
- Existing government policies and legal requirements in each State are considered (e.g. §10, LwaldG)
- Each time the GHG project is monitored, the GHG baseline assumptions are reviewed.
- If there are significant changes to the reference scenario, this will be adjusted accordingly.

## **LEAKAGE MANAGEMENT**

*Is the project addressing the risk of increasing carbon loss in its surrounding areas?*

- In general, leakage effects refer to changes in the carbon removal impact through effects on GHG sources and sinks resulting from activity shifts (internal) or market shifts (external) induced by the project. In the forest adaptation project type, the carbon removal volume in the reference scenario is insignificantly different from the removal volume in the project scenario. Thus, the risk of internal and external shifts is negligible. This decision to exclude is also backed up by our discussions with various experts (researchers and auditors) and is confirmed through our independent verification from TÜV Nord Cert.
- A third-party auditor, TÜV Nord Cert, has assessed all potential risk and leakage scenarios, and confirms the following: "Leakage (displacement) can be ruled out, since the withdrawal volume in the baseline scenario does not differ significantly from the withdrawal volume in the project scenario. (...) The project is in accordance with ISO 14064-2 requirements regarding this issue."
- Leakage estimates are negligible for our projects as described above.
- As described above, activity-shifting and market leakage have been taken into account and ruled out based on solid arguments

## **GOVERNANCE**

*Is the project's carbon impact appropriately designed, monitored and adapted over time*

- The methodology to estimate carbon benefits follows DIN EN ISO 14064-2:2019 guidelines for GHG accounting and reporting.
- The quantification of GHG emission reduction and removals corresponds to the procedure of the German Emissions Trading Authority and is accepted by the IPCC.

The methodology is comprehensive and considers significant GHG reservoirs and sources.

A third-party auditor confirmed the following:

- "The quantification of the sink performance is carried out with due diligence.
- The model used and all simulation steps as well as the conversion factors/assumptions used were taken from scientific publications, and the applicability of the model in other areas of Germany was confirmed.
- Random effects are compensated for by applying a Monte-Carlo simulation
- The simulation step extended by Pina Technologies GmbH is comprehensible and adds expected climate effects to the existing model.
- All sources used are publicly available and comprehensible."
- The relevant GHG sources, sinks and reservoirs (SSRs) were assessed and evaluated for relevance following the VCS methodology 'VM0012 Improved Forest Management in Temperate and Boreal Forests (LTPF), v1.2'.
- Out of 10 possible SSRs, 2 were considered to be relevant for the project type: above-ground and below-ground living tree biomass. All other SSRs have been excluded with diligent arguments.
- An independent auditor verified that "Project scope and estimated GHG emission reductions or GHG emission removals are in accordance with the applicable ISO 14064-2 Criteria."
- The GHG Project will conduct monitoring activities in the form of data collection to monitor forest adaptation activities as well as GHG reservoir on the GHG Project Area at regular intervals (years 3, 6, 10, 15, 20, 25, and 30).
- The project establishes a reference scenario which describes the desired end state of the forest on the project area after the 30 years. Based on this defined end state, which is used to assess the desired change in carbon impact, a range of measures are deducted. Progress against this target can thus be assessed by monitoring the status of implementation of the defined measures (e.g. thinning until a certain favourable density of the forest is reached, and subsequent planting of young trees of a certain species to reach the desired tree species distribution).
- The project goals are created based on a comprehensive understanding of initial conditions.
- The project continually monitors forest adaptation activities, GHG reservoirs, and ecological

- diversity through regular intervals.
- A set of parameters (fixed and variable) has been defined, that will be assessed and re-evaluated at every monitoring step. These parameters include data collected empirically on site, but also data bases and sources that are used as input parameters for modelling. By re-assessing these at every monitoring cycle and checking whether newer or more appropriate data is available, a constant high quality of modelling results is ensured.
- Based on monitoring results, necessary steps are taken to adapt and improve project measures, ensuring the carbon impact remains appropriately designed and managed over time.

## TRANSPARENCY

*Does the project have a transparent approach to data storage and communication, as well as taking steps to avoid double-counting?*

- Pina Earth communicates the up to date state of each project on a project website
- To collect forest condition information, project owner, project implementers, foresters, Pina Earth or subcontractors take georeferenced photos in the 12 months prior to the monitoring date.
- Monitoring is conducted in year 3, 6, 10, 15, 20, 25, and 30
- The project website containing relevant project information and updates is public
- Pina earth maintains a public registry which lists the credits for each project (bundled into vintages). The registry also contains information about the retirement.
- The GHG project description is prepared according to the ISO 14064-2 standard.
- Monitoring results and project updates will be documented via the project website.
- Validation and verification are carried out by TÜV NORD CERT GmbH, a well-known third party VVB.
- The carbon credits are listed on the registry's public database, allowing buyers, sellers, and other stakeholders to track the credits, their origin, and their current status.
- Once the project is verified, the registry issues carbon credits (also known as offsets) corresponding to the verified emission reductions. Each credit typically represents one metric ton of CO2 equivalent reduced or removed from the atmosphere.
- The GHG emissions and GHG emission reductions of German forests are included in the German Greenhouse Gas Inventory. This forms the basis for Germany's reporting to the European Union in relation to its Nationally Determined Contributions (NDCs) under the Paris Climate Agreement.
- As no "Corresponding Adjustments" under Article 6.4 of the Paris Climate Agreement are possible to date, any additional GHG emission reduction created by the GHG project is potentially counted twice.
- Consequently, GHG emission reductions from this GHG project cannot be used to offset GHG emissions and claim climate neutrality.
- However, other claims, such as contributing to achieve the German climate targets, are possible ("contribution claims").

## **Biodiversity Assessment**

### **BASELINE**

*Does the project demonstrate an understanding of the environmental context in which it operates?*

The project demonstrates an understanding of the environmental context in which it operates. Key points include:

- Compliance with national/site-specific data, models, and laws.
- Verification that the project area is not in a protected area (e.g., national park, nature reserve).
- The land cover of the project area is clearly identified and protocolled in the project specific forest inventory.

Identified ecosystem service values are:

Emphasis on tree species diversity, with site-appropriate and native tree species selection, based on regional scientific recommendations and climate impact scenarios.

Moreover ecosystem aspects like:

On-site water balance, soil type and quality as well as the nutrient availability of the soil is provided and considered.

- The state of the forest tree biodiversity is clearly identified and protocolled in the project specific forest inventory. The collection of the forest inventory data is based on a recognized procedure, including field verification.
- In order to secure ecosystem services in the long term, it will be verified whether the project measures lead to a continuous improvement in the structural diversity and species diversity of the forest stands over the GHG project period.
- Species diversity is described by the Shannon-Wiener index and its evenness. (The Shannon-Wiener index is a measure to determine the diversity of different tree species within a stand.)
- The project does not influence negatively the original conditions, therefore no actions are needed
- We keep track of all different tree species which are and will be introduced into the project area. Monitoring these species is very relevant and is measured through inventory data, data from photo documentation and remote sensing data.
- We do not measure any other taxa.
- This is outside of the project scope, therefore there is no assessment of the relations between the project area and neighbouring ecosystems.
- Potential side effects would be positive, e.g. new introduced tree species on the project are could spread to neighbouring areas and increase biodiversity.
- The assessment of relevant ecosystem aspects is based on scientific knowledge. For example: The determination of the site soil type is based on the data of the soil survey maps 1:200,000 of the Federal Institute for Geosciences and Natural Resources (Bundesanstalt für Geowissenschaften und Rohstoffe, 2022)

## **SUITABILITY**

*Is the intervention suitable for the ecosystem context?*

- The methodology relies on recommendations from a recognized research institute, accounting for current climate and climate impact scenarios (Riek, Russ, & Grüll, 2020).
- For example, in our Luckaitztal project, the project owner is committed to ensuring that at least three (3) future, site-appropriate tree species are present on the GHG Project Area after 30 years, each with at least 5% basal area share. The main tree species can make up a maximum of 70% of the base area of the total GHG project area.
- The project owner commits to increasing the diversity of tree species in the target condition through management, ensuring the Shannon Index for tree species diversity improves with each monitoring of the GHG project.
- All of these requirements for the forest owner are chosen taking into consideration how climate change will impact the intervention and trying to find the most appropriate actions to create a healthy mixed stand.
- Lastly, our methodological decisions are supported by using data from the Brandenburg Geoportal (Land Brandenburg, 2022).
- The methodology has been approved by external experts when it was approved by third party auditor TÜV Nord Cert.
- Additionally, the methodology is based on current scientific sources and follows applicable laws in Germany at federal, state, or municipal levels, including the Federal Forest Act and Federal Nature Conservation Act, as well as the respective State Forest Act and State Nature Conservation Act.

## **NATURE CONSERVATION**

*Does the project understand and address the direct threats and systemic drivers of environmental degradation and biodiversity loss?*

- The whole concept of the methodology and the projects relies on the idea of improving biodiversity to make forests more climate resilient. They thus don't entail any form of environmental degradation. By introducing climate-resilient tree species through planting or seeding and fostering natural rejuvenation, project activities try to adapt the forest to climate change and reduce the vulnerability to environmental degradation.
- Eligibility rules for the project activities, such as ensuring the presence of at least three future, site-appropriate tree species on the GHG project area after 30 years, and the selection of new species according to available scientific suggestions (which classically are produced for each German state & include rules on the usage of invasive species) make sure, that these efforts are baked into the project setup.
- Additionally, sustainable harvesting and hunting regimes are not only enforced by the project rules but governed by federal law in all German states.
- No threats to the environment through the project activities have been identified
- The main reason are the project activities which actively work against environmental degradation
- Illegal activities in the project area, which could threaten biodiversity can be ruled out, as a) the project areas are small enough to be closely monitored & b) the risk of illegal logging in Germany is generally very low
- Climate induced mortality of the trees in the forest is included in the modelling of the baseline & project scenario. Thus the carbon and biodiversity assessment is already based on assumed mortality rates.
- Other extreme threats (storms, fires, insect pests, unclear landownership, etc.) are additionally assessed in the non-permanence risk assessment.
- The mortality module of the forest simulation uses regionalized climate model data & single tree data.
- The non-permanence risk assessment judges natural threats based on regional data and other threats on national data
- The projects activities reduce the climate risk to the forest, and these effects are quantified.
- Other risks are mitigated through the project contract (such as overharvesting or non compliance with the project rules) or the risk buffer.
- The projects activities reduce the climate risk to the forest, and these effects are quantified.

## **BIODIVERSITY NET GAIN**

*Does the project play an active role in improving biodiversity?*

- The whole purpose of our project is to transition forests from monocultures to mixed stands which inherently increases the biodiversity of the tree species as mentioned in section 1.
- Measures such as promoting natural rejuvenation by thinning the upper storey and introducing new climate-resilient tree species are implemented in both the understorey and upper storey, which positively impacts biodiversity.
- Monitoring includes inventory data, data from photo documentation and evaluation, and remote sensing data to assess the project's impact on biodiversity.
- The methodology increases the amount of species in a forest by promoting a mixed stand over a monoculture. We do not specifically measure any other taxa beyond the tree species.
- Transitioning a forest in Germany from a monoculture to a mixed forest enhances ecosystem connectivity by promoting biodiversity and habitat heterogeneity.
- Mixed forests support a wider variety of plant species, creating a complex network of interactions among different flora and fauna, and boosting ecosystem resilience.
- This increased structural diversity attracts a broader range of pollinators, seed dispersers, and predators, enabling more efficient nutrient cycling and fostering stronger connections between habitats.
- Consequently, mixed forests reinforce the overall ecological stability and connectivity within the

landscape.

- As a requirement for the choice of new tree species to be introduced, they must be listed in an official scientific-based recommendation by the federal state for each project, which ensures a) species are native to the area; b) species fit for climate change are used and c) non-native species are avoided and invasive species are not used

## **ECOSYSTEM BENEFITS**

*Does the project play an active role in improving ecosystem services?*

The GHG project creates climate-resilient, productive forests, thereby protecting habitats and essential ecosystem functions. These include (Fachagentur Nachwachsende Rohstoffe, 2021):

- the contribution to climate protection by reducing GHG emissions in the atmosphere,
- the long-term protection of the habitat for animals and plants, as well as safeguarding biodiversity through risk-reducing and biodiversity-promoting management measures,
- promoting oxygen production, air filtration and cooling, water filtration and groundwater storage by preserving the forest and promoting forest growth,
- maintaining the supply of raw materials for economic use and job security, especially in rural areas, as forests continue to be managed, and
- the preservation and promotion of recreational, health and tourism value-added functions provided by forests.

Focus biodiversity:

- The project plays an active role in improving biodiversity. Key actions and features include:
- Introducing climate-resilient tree species through planting or seeding, which helps increase tree species diversity in the forest ecosystem.
- Ensuring the presence of at least three future, site-appropriate tree species on the project area after 30 years, with each having at least 5% basal area share, supporting the growth of native/indigenous species.
- Focusing on increasing tree species diversity by managing and improving the Shannon Index for tree species diversity with each monitoring of the GHG project, which contributes to a more diverse and resilient ecosystem.
- Establishing a near-natural permanent forest with a more sustainable and near-natural management approach, which is expected to enhance threatened, endangered, and/or critically endangered species and their habitats.
- Implementing measures such as thinning the upper storey to promote natural rejuvenation, which helps maintain and improve the overall health and biodiversity of the forest ecosystem.
- These actions demonstrate that the project actively works to improve biodiversity by increasing tree species diversity, supporting native/indigenous species, and implementing sustainable forest management practices.
- Our methodology proactively opposes chemical pesticides and fertiliser use. For our projects under WaldKlimaStandard, this is specifically mentioned in the project requirements, referencing the PEFC:  
“The use of pesticides needs to be avoided, and – if they are necessary - limited to a level that minimizes the risks to human health and the environment.”

## **GOVERNANCE**

*Is the project's biodiversity impact appropriately designed, monitored and adapted over time?*

- The project has a monitoring and evaluation system for forest adaptation activities, GHG reservoirs, and improvement of ecological diversity.
- The assessed variables include: Execution of tasks such as thinning, sowing/planting, fostering natural rejuvenation and hunting



- Focus on increasing tree species diversity by managing and improving the Shannon Index for tree species diversity with each monitoring of the GHG project
- Species diversity is described by the Shannon-Wiener Index and its evenness. The Shannon-Wiener index is a measure to determine the diversity of different tree species within a Stand.
- Metrics: Ecological diversity improvement is monitored, with a focus on tree species diversity and the Shannon Index.
- Targets for magnitude and direction of desired change are specified for each project at the start of the project. A high ambition level is ensured through the general project type (increasing structural and biological diversity)
- There is a very low risk that the tree species compositions achieved through the project will be changed after the project duration, as those new trees are too young to be harvested and there is no economic incentive for forest owners to reverse the measures on the project area
- Tree species diversity is therefore considered to be secured after the project
- A range of variable and fixed parameters have been defined, that will be monitored at every cycle
- These parameters include tree species
- Monitoring outcomes will be used to define necessary adaptation of measures

## **TRANSPARENCY**

*Does the project have a transparent approach to data storage and communication?*

- As Pina works directly with the forest owners, no intermediary is involved. At regular intervals (every three to five years), learnings and current knowledge about site conditions as well as findings from science will be exchanged and discussed between the different parties of the project.
- On Pinas registry dashboard, Pina gives detailed information about the impact of the individual project regarding tree species diversity and sustainable goals. The website is easily accessible by the public (see provided link).
- Verification and validation: The GHG project description was prepared for validation according to the ISO 14064-2 standard, and the validation and initial verification are carried out by TÜV NORD CERT GmbH.
- Project documentation and information is publicly available on the dashboard (see link to registry).

## **CONTEXT AWARENESS**

*Does the project demonstrate an understanding of the social context in which it operates?*

- In summary, the project does demonstrate an understanding of its social context, primarily focusing on the relationships between the project owner, developer, and implementer. However, it does not directly involve or affect external stakeholders or the local community.
- Relevant stakeholders: The GHG project is implemented on private land and the project activities do not affect any external stakeholders. As a result, the relevant stakeholders include the project owner, project developer, and project implementer.
- Contractual relationships: The project owner and the project developer have entered into a project agreement, and the project owner is in a contractual relationship with the project implementer regarding project activities.
- Community involvement: The local community is not assessed for this GHG project because they do not rely on the GHG project area for essential resources such as food, fuel, feed, medicine, or construction materials.
- The GHG project area is privately or corporately owned, and the project owner has contractually assured that they are the owner of the GHG project area and thus legally authorized to implement the measures.
- Land ownership and resource access rights are held by the same person, the project owner, and



potential conflicts over ownership and use of the project area are therefore eliminated.

- Additionally, the GHG project complies with all laws that apply in Germany at federal, state, or municipal level, including the Federal Forest Act and Federal Nature Conservation Act, as well as the respective State Forest Act and State Nature Conservation Act.
- There are no indigenous communities living within the project area
- All decisions regarding the project area are defined with the consent of the project owner, by contractual agreement.

## **STAKEHOLDER ENGAGEMENT**

*Are local and indigenous stakeholders included in project planning, management, and monitoring*

- Project ownership: The GHG project area is privately or corporately owned.
- Contractual relationships: The project owner is in a contractual relationship with the project developer and project implementer regarding project activities.
- Community involvement: The local community is not assessed for this GHG project because they do not rely on the GHG project area for essential resources such as food, fuel, feed, medicine, or construction materials.
- There are no community-level stakeholders involved
- The project does not consider anti-discrimination measures
- Pina Earth has a diversity policy mainly used for hiring processes, nevertheless these standpoints also hold true for any professional relationships and partnerships in Pina's business practice
- All decisions regarding the project area are defined by and with the consent of the project owner
- As the project area is privately owned, there are no directly affected stakeholders other than the project participants

## **HUMAN RIGHTS**

*Is the project taking action to respect, protect and enhance rights?*

- Both ownership and resource access rights are held by the same person, the project owner (or forest owner). Therefore, conflicts over ownership and use of the project area are eliminated within our scope of the project.
- Community involvement is also no risk because the local community does not rely on the GHG project for essential food, fuel, feed, medicine, or construction materia. (Verified Carbon Standard 2019).
- As the project areas are located in Germany, landowner rights are protected by law.
- Freedom House is a non-profit organization which assesses every country's degree of political freedoms and civil liberties. When evaluating Germany, they provide a "1", the best possible score for both categories.
- All of our projects are located in Germany and are therefore protected under these laws. Therefore, as human rights are less of a concern in Germany compared to other locations, we do not publicly provide due diligence in response to human rights.
- That being said, we do consider this to be an important issue and if any concerns were to be present in the future, we would address them very seriously for our projects.
- Our PDDs provide clear language dictating who has rights to the land, the forest owners. We have not ever encountered a human right, land, or labour right issue from any project but would readily apply any learning from this were it to occur.
- Again, as these rights are heavily protected under German law, these concerns may be less pressing here
- No consent is required for our circumstances yet as we do not have any project locations that have rights from indigenous people or local communities. When necessary, the proper FPIC will

be obtained.

- If applicable in the future, the appropriate local interlocutors will be represented fairly.
- The immediate and long-term project outcomes of the project are explained in detail and simulated for the forest owner. Through many talks, all stakeholders are informed through the expected changes from the project outcomes.
- Plenty of time is provided for all contracts provided with forest owners (as they have bargaining power as well before accepting).
- For other parties, if this was necessary, enough time would be provided and we have not engaged in this activity before.

## **EQUITY**

*Has the project demonstrated improved equity through its benefit-sharing and decision-making processes?*

- The carbon credits issued from the project activity are transferred to the project owners.
- A small share of the revenue is billed to the project owner by Pina Earth for the service of simulation and - if applicable - a sales fee.
- The largest share of the revenue is thus channelled back into the project via the project owner and contributes to the investments needed to perform project activities.
- The share of revenues is communicated clearly and transparent at the start of the project and manifested in the project contract.
- Project partners are private land owners that enter into a contractual agreement on a voluntary basis and with at least a preliminary feasibility assessment outlining the potential revenue that the project will achieve; empowering project owners to make an informed decision.
- Not applicable to forest adaptation projects, as vulnerable groups are not affected by the project measures or outcomes..

## **LIVELIHOODS**

*Has the project demonstrated improved livelihoods through both direct investment and ecosystem services?*

- By creating a healthy, climate-resilient forest, our projects have recreational, health, and tourism value: Forests have the potential to improve the well-being of those living in the area as there is a proof that recreational areas like forests improve overall livelihood
- The project promotes the security of available forestry related jobs, particularly in rural areas, as forests continue to be managed.
- Our project improves access to raw materials and natural resources by promoting sustainable forest management practices such as selective harvesting, and protection of biodiversity, which ensure that forest resources are available for future generations.
- This, in turn, enhances livelihood security by providing economic opportunities

## **EDUCATION**

*Has the project demonstrated improved education and training opportunities?*

- By demonstrating the added value in terms of carbon storage in climate-resilient mixed forests through the Pina Earth simulation, we provide data for informed decision-making for improved forest management and promote sustainable behaviour

## **HEALTH**

*Has the project demonstrated improved health and resilience to disasters, including direct investment and ecosystem benefits?*

- The project provides important ecosystem service such as promoting oxygen production, air filtration and cooling, water filtration and groundwater storage by preserving the forest and promoting forest growth

- Risk mitigation: The project diversifies the forest with climate-resilient and native tree species and increases structural diversity, which helps mitigate **all mentioned risks**.

## **GOVERNANCE**

*Is the project's social impact appropriately designed, monitored and adapted over time?*

- Forests in Germany are publicly accessible by law. The public thus benefits from healthier forests with increased diversity distributions in age and species.
- The forest restructuring measures will mostly be conducted by the same people that manage the forest before the project starts. The overall workload increases because of the additional measures that are to be conducted which creates the potential for additional jobs.
- The only project stakeholders are Pina Earth, the forest owners and the forest managers. Pina Earth and the forest owner/owners have a contractual agreement. The forest managers are either contracted or employed by the forest owners.
- As stated before it is intended to maintain the state of a healthy and diverse forest after the project has ended. Thus the benefit for the public of having access to such forests persists.
- Pina Earth will monitor the projects in regular intervals. Making sure the methodology is applied correctly and effectively serves as implicit monitoring for the social impact goals as both are deeply connected.
- The social impact strategy is not subject to change as both benefits are deeply connected to the overall project goals.

## **TRANSPARENCY**

*Does the project have a transparent approach to data storage and communication?*

- Any change in information about the project area that is relevant to be shared can be found updated in the public registry which describes the project areas and their relevant details.
- Pina hosts a dashboard which includes the available projects, details about the projects, and further information related to how Pina generates its carbon credits
- The GHG project description was prepared for validation according to the ISO 14064-2 standard.
- The validation and initial verification are carried out by TÜV NORD CERT GmbH. This indicates that the project documentation is validated and verified by a well-known third party.
- Additionally, the methodology is in the process of being approved by the Wald-Klimastandard. There is also public access to webinars which describe the methodology in detail.
- The Project Design Document is accessible on request via the dashboard.