Reforest Better

A guide to high-impact tree growing projects

METHODOLOGY FOR ASSESSING TREE GROWING SCHEMES AND PROJECTS (CERTIFIED AND NON-CERTIFIED)

Nature 4Climate

HAMERKOP
CLIMATE CHANGE & FINANCE

TRILLION TREES

WCS

WWF

BirdLife INTERNATIONAL

1t.org

Executive Summary

Executive Summary

Key Insights

1.0

WHAT MAKES A HIGH-QUALITY TREE GROWING PROJECT?

More than planting trees, restoration is about growing the right trees in the right places with the right people. High quality tree growing projects look like this:

1. Go for native seeds rather than introductory species
2. Start with a thorough understanding of the topography and socio-cultural context
3. Engage with Indigenous and local communities from the start and throughout all stages of the project
4. Offer local benefits to local people and biodiversity
5. Have effective and transparent monitoring and evaluation processes in place
6. Understand carbon capture calculations and provide transparent data on it
7. Provide means to halt deforestation
8. Address climate impacts with opportunities for carbon mitigation and adaptation

Introduction

2.0

The planet is at a tipping point. Unsustainable ways of living and working have changed the ways we interact with nature and the hard impacts of climate change are felt across all ecosystems and livelihoods. Nature is one key solution to address and adapt to current impacts, as well as prevent further devastating costs to the planet and its peoples.

Restoring natural ecosystems through the planting of trees is not a new concept for climate solutions. However, tree planting schemes are becoming an increasingly popular choice for corporations to balance out (or offset) their greenhouse gas emissions. While we must prioritise greater ambition and action towards emission reductions within value and supply chains, investing in forests can be a powerful supplement to ensure we are tackling both climate and biodiversity crises, as well as safeguarding communities on the ground.

Planting a tree is not an end in itself. On the contrary, planting is the very first step of a long and rich endeavour. Investing in trees for long term tangible climate, social and biodiversity benefits requires that we reorient our focus from “planting” to “growing” schemes. This includes addressing restoration with special attention on promoting and protecting native plant species, preserving natural ecosystems and providing a framework for sustainable land management.

This guide has been designed so that businesses, project developers, and funders are able to better select and implement meaningful forest restoration and tree growing projects. Rooted in science, Reforest Better provides acessible information on how to assess restoration projects against key criteria such as plant species selection, the inclusion of local communities, preservation of natural ecosystems and livelihoods, and transparency on how emissions are calculated.

“Planting a tree is not an end in itself. On the contrary, planting is the very first step of a long and rich endeavour.”

Colophon

3.0

3.1

LEADING AUTHORS

Dr. Lauren Oakes - **Science Advisor for Reforest Better**

Lauren is a scientist, author, and educator who works at the interface of problem-solving environmental research, conservation practice, and science writing.

She is a Conservation Scientist with the Wildlife Conservation Society (WCS) on the Forests and Climate Change team, an Adjunct Professor in the Dept of Earth System Science at Stanford University, and a freelance writer. Her first book, In Search of the Canary Tree, is a hopeful story about the search for resiliency in a warming world.

Dr. Susan Cook-Patton - Science Advisor for Reforest Better

Susan is a Senior Forest Restoration Scientist on the Natural Climate Solutions Science Team at the Nature Conservancy. She works to quantify the climate mitigation potential of reforestation and other natural climate solutions and infuse the best-available science in policy decisions.

She has over a decade of experience leading scientific investigations into how changes in biodiversity and climate are impacting forest, grassland and urban ecosystems. Before joining the Nature Conservancy in 2016, she was a policy fellow at the US Forest Service and a research fellow at the Smithsonian Institution.

Shevanti Nefdt - Consultant at HAMERKOP

Shevanti holds an MSc in Environmental Technology from Imperial College London and a BSc in Biology. Having lived in Zambia, Ethiopia, and Kenya, she has acquired a global perspective on environmental issues.

She has experience working alongside experts at the World Agroforestry Centre in Nairobi, Kenya to develop resilient food secure systems and vegetation maps for suitable crops. She has also contributed towards research on the development of crops adapted to extreme climatic conditions in the face of climate change.

Colophon

3.0

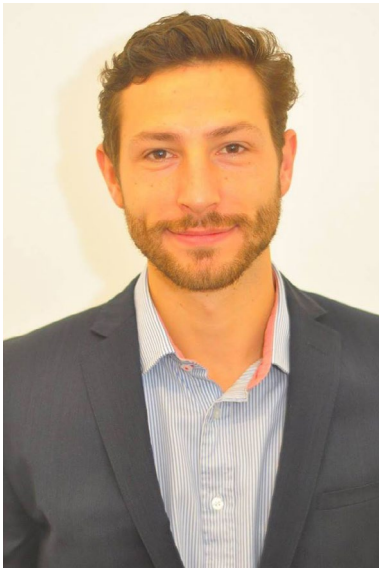
3.1

LEADING AUTHORS

Colin Rebel - Consultant at HAMERKOP

Colin worked for eight years at the French forest management national agency (Office national des forêts). He has strong experience in sustainable forest management and environmental engineering.

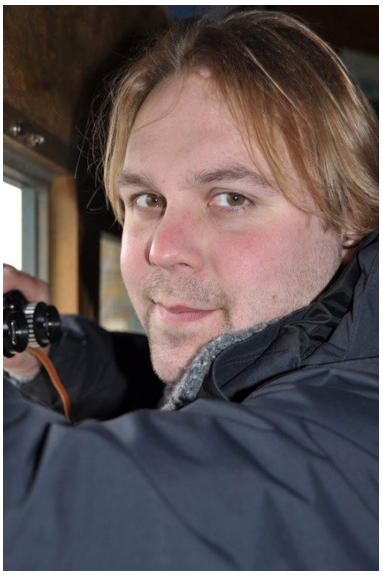
Colin holds an MSc in Sustainable Development Engineering from AgroParisTech, the top-ranked Paris institute of technology for life, food and environmental sciences. He has expertise in various forms of sustainable land management including sustainable agriculture, agroforestry, forestry and nature-based solutions.



Olivier Levallois - Director at HAMERKOP

Olivier has been supporting the development and assessment of climate change mitigation and adaptation projects for over 13 years. He has worked on the development of carbon certification protocols for forestry, with governments and international organisations on setting up REDD+ institutional frameworks and with NGOs on obtaining climate-related funding.

Olivier is currently a member of the roster of climate experts of the Gold Standard, NORCAP, the World Health Organisation and ISO. He holds a MSc in policies and economics of environment and international development from the London School of Economics.



James Lloyd - Director at Nature4Climate

James Lloyd leads the Nature4Climate platform. N4C aim is to increase ambition and implementation of Nature-Based Solutions for climate change with a membership of UN agencies, international NGOs and multi sectoral coalitions.

James is an environmentalist and naturalist who is also an expert in strategic communications and advocacy. Previously having spent over a decade and half working in and around the UK Parliament advising UK political parties and a number of large NGOs.

Colophon

3.2

ABOUT NATURE4CLIMATE

Nature4Climate (N4C) is an initiative with 19 participating organizations:

- → UN Development Programme
- → UN-REDD
- → UN Environment Programme
- → Convention on Biological Diversity
- → International Union for Conservation of Nature
- → Birdlife
- → Youth4Nature
- → Conservation International
- → Environmental Defense Fund
- → The Nature Conservancy
- → Wildlife Conservation Society
- → Woodwell Research Center
- → World Business Council for Sustainable Development
- → World Resources Institute
- → WWF
- → We Mean Business
- → Food and Land Use Coalition
- → Global Mangrove Alliance
- → Re:wild (formerly Global Wildlife Conservation)

N4C aims to increase investment in and action on nature-based solutions (NbS). We do this by catalysing partnerships between governments, civil society, business and investors. We campaign to integrate NbS into all government decision-making, to enhance ambition in NDCs using NbS, and to increase and reform finance flows for NbS.

3.3

ABOUT HAMERKOP CLIMATE IMPACTS

HAMERKOP is a London-headquartered boutique consultancy specialising in climate change and climate finance, with the intent to trigger social and environmental impacts in developing countries. The vision of HAMERKOP is a world where international climate finance efficiently and directly services the interests and rights of local communities to a clean and resilient development focused on inclusive welfare.

HAMERKOP provides advisory services around 3 main pillars: forestry and energy access climate project certification and implementation; independent expert advice on the carbon markets; and advisory on climate change policy and projects formulation and assessment.

HAMERKOP works at the intersection of the public and private sectors, with governments, international organisations, NGOs and private companies. It helps its clients design, implement, manage and monitor projects and activities that deliver measurable social and environmental impacts and are eligible to climate finance mechanisms.

3.4

SUPPORTING PARTNERS

- → Trillion Trees (Wildlife Conservation Society, BirdLife International and World Wildlife Fund)
- → TreeAid
- → 1t.org

Methodology

4.0

Rooted in science, Reforest Better is a product of the partnership between Nature4Climate and HAMERKOP to address the need for more transparent and accessible information on profiling high quality restoration projects.

The methodology used to conceptualise and design Reforest Better combines scientific knowledge from existing literature and consultations with technical experts. The final methodology is not intended to create a hierarchy nor to endorse any specific approach to tree growing. Rather, it is intended to fill a gap in the market for information at a level which is both scientifically sound and accessible for companies. This is also likely to help support existing tree growing projects in maximising their success and to guide tree growing project developers to ensure they are developing a project that is sustainable in the long-term and offering benefits for biodiversity, local livelihoods, and the climate system.

First, an in-dephth scientific literature review was conducted to identify a set of criteria that would illustrate best practices amongst tree growing projects. Consultations with Dr. Lauren Oakes, from the Wildlife Conservation Society (WCS) and Dr. Susan Cook-Patton, from the Nature Conservancy, were performed throughout the project.

Once identified the criteria, a traffic light scoring system has been developed so that users could perform a self assessment of their projects against recognised best practice for tree growing projects. In this system, the colours red, amber and green were used to set the standards for each criterion developed. This scoring system has been developed for the user to be able to clearly identify characteristics that demonstrate best practices amongst tree growing projects. Furthermore, the scoring system provides tree growing project developers with the opportunity to identify potential areas of improvement to strengthen their projects and strive for excellence.

To test the feasibility of the criterion, the methodology was applied to analyse a number of certified and non-certified projects using a random but representative sample of existing tree growing projects. Using a mixed purposeful sampling method was able to meet the needs of multiple interests and provide the opportunity to use triangulation to develop a comprehensive understanding of existing tree growing projects in relation to the criteria. This sampling method also provided an opportunity to not only test the feasibility of the criteria against a diversity of existing projects, but also enabled the identification of additional aspects in the best projects that could be used to further refine the methodology itself.

The selection consisted of six projects, five certified and one non-certified project. The certified tree growing projects were selected from those listed under the Verified Carbon Standard (VCS) and the Gold Standard (GS) that had already issued carbon credits. It is possible for projects to gain the Climate, Community, and Biodiversity (CCB) certification standard in addition to the VCS thus, at least one project with this double certification was selected. The selection process for the certified projects accounted for projects across a range of geographic locations.

Information on the tree growing projects was obtained through accessing the VCS and GS registry, which contains the project's certification documentation, as well as viewing marketing materials on the project developers' websites. While the certified case studies enabled the refinement of the tool through available documentation, a different approach was used to test the methodology on one non-certified tree growing project sourced from a tree growing supplier. The methodology was made available for OneTreePlanted to assess one of their own projects to test the usability of the tool for users with existing knowledge of the project (e.g. project developers). The feedback from OneTreePlanted was used to further refine the tool. Some of the top scoring projects are featured in this guide as examples of best practice in action.

Assessing Tree Growing Projects

5.0

Specifically of interest for project developers, practitioners, NGOs, consultancy firms, and corporates, the Restore Better Guide directs users through a set of 13 criteria, outlined below.

While some criteria questions may be omitted or adapted depending on whether the user is looking to assess a project that generates carbon credits to sell to companies looking to claim credible carbon emission reductions that contribute towards net-zero targets, no hierarchy has been placed between each of the criterion and all items should be considered in order to achieve best practice in tree growing schemes.

The final product of this methodology has also been made available as an online user-friendly tool which is accessible and available to anyone interested in either assessing or identifying criteria that is likely to define best practice amongst both non-certified and certified tree growing projects.

In the online version, each question is framed in a manner that incorporates each criterion. For each question, the user is given three potential answers. The user selects the answer that most accurately reflects the project they are assessing.

Once an answer is selected, the project will be given a score of red, amber, or green which measures the extent to which the project they are assessing follows best practice. Once the user has answered all the questions, a results page will be provided summarising where the project has scored under each assessment criteria. The tool does not provide an overall score but instead seeks to showcase where the project stands on each criteria.

For a detailed overview of the criteria selected, including identified best practice, measures of success and potential scores, see the table below:

Assessing Tree Growing Projects

5.1

CRITERIA	BEST PRACTICE	MEASURE OF SUCCESS/ INFORMATION	SCORING SYSTEM
1. SPECIES SELECTION AND PLANTING METHODS	Tree growing project should prioritize the use of native species. Native species are more suitable for local conditions than introduced species[1]. The introduction of invasive species should be actively opposed to, however non-native species may be used as catalysts for native regeneration[2]. Projects should incorporate a mix of native species to ensure they are not producing a monoculture plantation, and so that newly planted areas resemble local forest conditions as much as possible. Using a range of native species allows for improved biodiversity and develops ecological resilience[3]. Trees should be planted during their preferred planting seasons. Consideration should be given to seed sourcing from within their native range (or expanding range) to favour species that may be better adapted to future climate conditions. Natural regeneration is an effective approach to re-establishing native plant diversity[4], and is a preferred approach if appropriate for the project scope.	Project documentation should detail the species type and amount that are to be planted. If possible, this should be supported with on-the-ground confirmation to ensure plantings are implemented as planned. Detail of when the trees have been or will be planted should be available. Documentation and progress reports should correspond with planting schedule.	**RED:** No evidence that native species are used. Project only uses monoculture planting and introduced species. No information that indicates that there is recognition given to planting season. **AMBER:** Project prioritizes the use of native species. A few non-native species may be used as catalysts for native regeneration or for agroforestry purposes. Consideration may not be given to seed sourcing, planting season, or restoring natural habitat. If the project has a monoculture plantation proponent, the project designates an area of natural regeneration and considers the use of a buffer zone. **GREEN:** A range of native species are planted to support biodiversity development and ecological resilience. Consideration is given to the planting season of each plant and this is respected in practice. Nursery plants or seed stock are sourced from within their native range. Assisted natural regeneration or active restoration may be included, as one of the most cost-effective methods of restoring natural forests. Any use of non-native species has clear objectives and rationale behind it and is only done as a small proportion.

[1] Veldman J.W, Overbeck G.E. et al (2017) Where Tree Planting and Forest Expansion are Bad for Biodiversity and Ecosystem Services. *Bioscience* 65, 1011-1018. Doi: 10.1093/biosci/biv118

[2] Chazdon R. L, Lindenmayer D, Guariguata M.R, Crouzeilles R, Benayas J.M.R & Chavero E.L (2020) Fostering natural forest regeneration on former agricultural land through economic and policy interventions. Environmental Research Letters 15(4).

[3] Thomas Evert, Jalonen R, Loo J et al (2014) Genetic considerations in ecosystem restoration using native tree species. *Forest Ecology and Management* 333, 66-75.

[4] Schlaepfer M. A, Sax D. F & Olden J. D (2011) The potential conservation value of non-native species. *Conservation biology*, 25(3), 428-437

Assessing Tree Growing Projects

5.2

CRITERIA	BEST PRACTICE	MEASURE OF SUCCESS/ INFORMATION	SCORING SYSTEM
2. LOCATION	The project considers the impact on the structural (carbon sequestration and water yield) and functional (biodiversity) components of the existing ecosystem[5]. Projects can support biodiversity conservation by targeting areas where plantings reconnect forest fragments and provide links between habitats. Project should prioritize land that was previously forested and not jeopardise local communities' livelihood by taking away land from other essential usages, such as cropping or grazing, without providing high value and sustainable alternatives for these activities. Land used for tree planting should not be taken away from other native ecosystems that support carbon sequestering, such as grasslands[6]. To ensure that land is viable for planting, projects should assess forest restoration potential, conservation value, past land use, and economic opportunities from alternative land uses. A thorough topographic assessment of these measures can increase the feasibility and success of forest restoration. This can be further verified through on-the-ground identification, satellite imagery, and discussion with local communities.	Project should perform a thorough assessment of the tree planting location, which may include a topographic assessment, on-the-ground verification, and discussion with local communities. Project should extensively detail the current and previous usage of the site.	**RED:** Land use change is negatively impacting local communities by taking away from vital resources, including current and alternative land use. The land identified for planting is being taken away from an ecosystem which is not suitable for planting and is happening in locations that would not naturally support forest cover. **AMBER:** Location of plantings are available but not detailed. Some consideration is given to the type of land used for project, but may not include detailed information about the current and previous land uses. The project has no negative impacts on local community, but may not fully consider supporting ecological health and local livelihoods. **GREEN:** Detailed information is available on the location of plantings. Land which is used in the project considers an appropriate tree density based on what would naturally occur. Tree planting occurs on unused/poorly used land and supports ecological health and local livelihoods. The project considers the impact on the structural (carbon sequestration and water yield) and functional (biodiversity) components of the existing ecosystem. For example, plantings could provide links between habitats to prevent forest fragmentation.

[5] Cunningham S.C, Mac Nally R, Baker P.J et al (2015) Balancing the environmental benefits of reforestation in agricultural regions. *Perspectives in Plant Ecology, Evolution and Systematics* 17(4), 301-317.

[6] Bond W & Zaloumis N.P (2016) The deforestation story: testing for anthropogenic origins of Africa's flammable grassy biomes. *Philos Trans R Soc Lond B Biol Sci* 371, 1696. Doi: 10.1098/rstb.2015.0170

Assessing Tree Growing Projects

5.3

CRITERIA	BEST PRACTICE	MEASURE OF SUCCESS/ INFORMATION	SCORING SYSTEM
3. MONITORING SUCCESS	Projects should regularly measure progress towards intended outcomes using on-the-ground and/or satellite measurements. The frequency and extent of tracking will be dependent on the project size. Monitoring is especially important in the early years to ensure trees do not have any establishment problems. The tree cover (%) should be tracked on some form of database/registry that can be accessed by stakeholders. Adequate monitoring should prevent double counting of tree planting and growing efforts. The socioeconomic impacts should be taken into consideration and monitored throughout the project. Monitoring of the socioeconomic impact could involve participatory monitoring to strengthen the inclusion of the community. The project should promote social learning and be adaptive[7]. Monitoring data should be made available to stakeholders. A baseline measurement should be established for these ecological and socioeconomic conditions to measure the progress of the project. The monitoring makes use of multiple forms of knowledge appropriate to the project scale and context (e.g. indigenous knowledge and science, forestry and climate change studies, other expert opinions). Data from monitoring is used to improve the state of the project and adapt to the future needs of the local community. Baseline ecological and socioeconomic data has been collected.	Monitoring practices should be clearly outlined in the initial project documentation, with evidence of accurate monitoring being undertaken throughout the project and at regular interval. Information regarding the frequency and type of monitoring should be available through the organisation. Monitoring should also be supplemented through on-the-ground interviews. The use of socioeconomic indicators in monitoring practices should be evident in the project documentation in addition to monitoring of the trees. A baseline measurement (for monitoring the current socioeconomic situation, existing deforestation rates, drivers of deforestation, forest cover etc.) should be visible in project documentation.	**RED:** No, or very little, evidence of monitoring practices or tree tracking. Difficult to identify survival rate of trees due to lack of available information. No baseline ecological and socioeconomic data has been collected. **AMBER:** Some evidence of monitoring practices and form of registry/database but is largely lacking transparency. However, this registry may lack consistent records of monitoring and tracking. Monitoring is occurring through on-the-ground and/or satellite measurements. Socioeconomic impacts are monitored, but monitoring does not involve any participation from the local community. Baseline ecological data has been collected. No socioeconomic baseline data has been collected. **GREEN:** Detailed description of monitoring practices using both satellite and on-the-ground measurements to track progress of trees is easily accessible to stakeholders and highly transparent. Regularly updated database/ registry recording the progress of projects and evidence that different types of monitoring are being undertaken periodically in all projects. Monitoring data includes a verification framework in place.

[7] Gilmour D (2007) Applying an Adaptive Management Approach in FLR. Chapter 4 in J. Reitbergen-McCraken, S. Maginnis, & A. Sarre (Eds.) *The Forest Landscape Restoration Handbook* (pp.29-38). Earthscan, London

Assessing Tree Growing Projects

5.4

CRITERIA	BEST PRACTICE	MEASURE OF SUCCESS/ INFORMATION	SCORING SYSTEM
4. INCLUSION OF LOCAL COMMUNTITIES	The project should include a diverse set of stakeholders from the local community throughout the project, including choice of actions and project governance. Women's participation should be promoted in decision-making to ensure gender equality[8]. Planting should be done with the inclusion of local communities. Projects can further benefit local communities by developing recreational areas for usage, increasing food production or providing income-generating activities. The project must also be willing to adapt to the local needs of the community in the future. Engaging with communities throughout the project will ensure that tree growing is undertaken successfully, allowing the trees to thrive and ensure that they remain in the ground[9]. Local engagement is important for long-term carbon sequestration.	Project documentation should highlight how the project will include the local community at all levels. Interviews with local communities should also find that they have had a positive experience with the project and that they intend on supporting efforts to keep trees in the ground. Evidence of engagement and regular consultations scheduled with a board/committee consisting of members from the local community. The project should have data detailing the participation of women in the project.	**RED:** No evidence of the inclusion of local communities in the decision-making process or recognition of their needs. Project does not consider the planting's impact on local communities. **AMBER:** Project incorporates some consultation with local community, however, may not consistently engage with the local community. Supporting data can include, for example, maps showing community land use planning, FPIC process, land ownership information, or socio-economic benefits but not demonstrate evidence of consistent engagement. **GREEN:** From the beginning, project developers have been in contact with members of the local community to ensure their needs are supported and that they have been involved in the project design. Project works to support development and improve the livelihoods of local communities through providing recreational areas, food production or providing income-generating activities. Project explicitly supports the livelihoods of women.

[8] de Siqueira L.P, Tedesco A.M, Meli P et al (2021) Gender inclusion in ecological restoration. *Restor Ecol*, 29: e13497.

[9] Schirmer J. & Bull L. (2014) Assessing the likelihood of widespread landholder adoption of afforestation and reforestation projects. *Global Environmental Change* 24, 306-320.

Assessing Tree Growing Projects

5.5

CRITERIA	BEST PRACTICE	MEASURE OF SUCCESS/ INFORMATION	SCORING SYSTEM
5. DEFORESTATION -REDUCTION ACTIVITIES	Given the immense benefits that standing, intact forests deliver[10], projects should aim to avoid continued forest conversion (removing or further degrading natural forest to meet other land needs) or landscape-level deforestation. To mitigate deforestation, the project should support forest related livelihoods such as developing recreational areas for usage, increasing food production, or providing income generating activities. Without alternative sources of income, the risk of leakage from deforestation within the project (or moving elsewhere) is high[11].	Details of deforestation-reduction activities are discussed in the project documentation. Monitoring information should verify that deforestation in and around the project area has been stopped. Surveys of local communities should verify how the project has provided alternative sources of income.	**RED:** No action to reduce forest conversion or landscape-level deforestation in the tree growing project. **AMBER:** There are some activities to reduce forest conversion or landscape-level deforestation in project design and implementation (e.g. support for livelihoods and policy). **GREEN:** There are activities in place that explicitly address forest conversion or landscape-level deforestation through support from improved and alternative livelihoods, policy and/or sustainable land use management plans. Monitoring is also in place to ensure leakage is not occurring during deforestation-reduction and tree growing activities.

[10] Carlucci M.B, Brancalion P.H.S, Rodrigues R.R et al (2020) Functional traits and ecosystem services in ecological restoration. *Restoration Ecology* 28(6), 1372-1383.

[11] Schwarze R, Niles J.O et al (2002) Understanding and managing leakge in forest-based greenhouse gas mitigation projects. *Phil. Trans. R. Soc. Lond. A* 260(1801), 1685-1703. Doi: 10.1098/rsta.2002.1040

Assessing Tree Growing Projects

5.6

CRITERIA	BEST PRACTICE	MEASURE OF SUCCESS/ INFORMATION	SCORING SYSTEM
6. FOREST COVER PERMANENCE*	Tree planting projects should have a final tree cover (%) target established. Even with a final tree cover target, changes in tree density might occur. Therefore, the project must be able to account for these changes and have plans in place to keep working towards the final tree cover target. Targets should be tailored to the natural vegetation density for the native ecosystem[12]. *Final tree cover targets should ensure carbon permeance, such as a CO2 buffer to compensate for the loss of trees due to natural or man-made circumstances during the project lifetime. This ensures that carbon is still offset, even if the project does not meet its CO2 sequestration target.	Current and final tree cover targets must be clearly stated. Proof of plans to restore tree cover targets due to potential changes should be in place throughout the project timeline. Tree cover targets from the project can be compared to corresponding natural tree cover densities that occur globally[12] and on the Restor open data platform[13]. *Longevity of carbon storage should be outlined in project documentation and details of what will be done with the trees at the end of the project guarantee period should also be specified.	**RED:** No tree cover targets or measurements are stated. *Carbon reduction guarantee is less than 20 years or is not detailed. No consideration for how the land/trees will be used at the end of the project. No evidence of a permanence assurance to replace failed tree plantings. No CO2 buffer in place to mitigate a lower sequestration than promised. **AMBER:** Tree cover targets are stated but no plans are in place on how to restore trees in the event they do not survive. *Carbon reduction guarantee is 20 to 50 years. Little detail or trees are planned to be cut down at the end of the project. **GREEN:** Final tree cover targets are clearly stated. Proof of plans to restore tree cover targets due to potential changes during the project timeline. Final tree cover targets reflect the % tree cover of local natural forest tree cover. *Carbon reduction guarantee is greater than 50 years. Detail regarding how trees/land are used at the end of the projects and confirmation that carbon sequestration will not be reversed. CO2 buffer details are clear and there is evidence of being implemented in practice.

*For only those wanting to know more about emission reductions or for corporations who are wanting to invest in projects to make emission reduction claims.

[12] Crowther T.W, Glick H.B, Covey K.R et al (2015) Mapping tree density at a global scale. Nature 525, 2001-205.

[13] Restor, science-based open data platform to support and connect global restoration.

Assessing Tree Growing Projects

5.7

CRITERIA	BEST PRACTICE	MEASURE OF SUCCESS/ INFORMATION	SCORING SYSTEM
7. CARBON BENIFITS AND ACCOUNTING	Accurate and detailed description of carbon sequestration capacity of a project. This is preferably measured by tCO2 sequestered over the project lifetime. This calculation should be verified by a second or third party to confirm it is accurate and incorporates all aspects of carbon sequestration. There is a difference between (1) initiatives where high-level carbon benefits are reported and estimated using global data, and (2) those where carbon benefits have been comprehensively assessed and verified against third party standards.	Documentation on how carbon accounting is undertaken and what factors are included. Evidence of second or third-party verification should be available and displayed publicly.	**RED:** No information presented on how carbon sequestration is calculated. **AMBER:** Evidence of carbon accounting, but may not clearly explain the calculation, the methodology used is proprietary or the calculation is not verified by an independent party. **GREEN:** Clear, detailed information regarding how carbon sequestration capacity is calculated for projects. The calculations should incorporate all aspects of carbon storage and should be verified by an independent party. The initiative could also, instead, report on net carbon impacts but make clear that offset claims cannot be made.

Assessing Tree Growing Projects

5.8

CRITERIA	BEST PRACTICE	MEASURE OF SUCCESS/ INFORMATION	SCORING SYSTEM
8. BASELINE AND PROOF OF ADDITIONALITY	Transparency on how baseline emissions are calculated. Details to prove how the project ensures additionality is achieved. Baseline should be re-evaluated throughout the project lifetime to ensure that calculations remain up to date with changes in the on-the-ground situation. Projects could use control treatment plots to evaluate the success of the project relative to comparable locations where no project has been implemented in areas whereby project could be impacted by environmental issues.	Evidence of baseline and additionality calculations and considerations are included in project documentation. Baseline calculations should occur periodically throughout the project lifetime.	**RED:** No evidence of baseline or additionality calculations. No independent party confirmation of this calculation. The issue of additionality is not addressed. **AMBER:** Evidence of baseline calculation and additionality, but calculations are not verified. **GREEN:** Detailed and verified calculations of baseline and additionality. Clear information on what alternative uses would be for the land without a project. Baseline is periodically recalculated throughout the project.

Assessing Tree Growing Projects

5.9

CRITERIA	BEST PRACTICE	MEASURE OF SUCCESS/ INFORMATION	SCORING SYSTEM
9. IMPACT REPORTING	Quantitative analysis to measure how the project impacts local biodiversity, people, health, education and income should be publicly available. Reporting should use qualitative analysis to document and measure the project's impact relative to a baseline. For example, reporting should track survival rates over time, tree growth, and deforestation, as well as include field surveys to assess ecological and social impacts. Impact reporting should be communicated to stakeholders either through in person presentation or in a digital format.	Impact reporting should be undertaken periodically during the project and detailed in the project documentation. Impact reporting is clearly communicated to all stakeholders. Projects should have a publicly accessible database/registry with project activities. This should be frequently updated with information on the progress of projects, the extent of the project and how the project is impacting (either positively or negatively) the local community.	**RED:** None or very little, evidence of impact reporting. **AMBER:** Some evidence of impact reporting occurring, but may not include extensive qualitative analysis. **GREEN:** Detailed evidence of impact reporting occurring both before and during project lifetime. Results are easily accessible to all stakeholders.

Assessing Tree Growing Projects

5.10

CRITERIA	BEST PRACTICE	MEASURE OF SUCCESS/ INFORMATION	SCORING SYSTEM
10. LAND RIGHTS	All certified tree growing schemes require evidence of land rights (e.g. documentation showing purchasing agreements and certificates of customary ownership). This documentation should also be available for non-certified projects. Organisations should work with local community to strengthen/formalise property rights. Agreements must be made between the local community and funders regarding ownership of potential carbon credits.	Project documentation should detail how land rights and ownership of carbon credits issues are addressed and certification on land rights should be available.	**RED:** No documentation available on land rights and the ownership of emission sequestration rights is considered in project specification. Project adversely impacts the local community through failure to engage in discussions of land rights and ownership of emission sequestration rights. **AMBER:** Evidence of land rights and emission sequestration rights and ownership documentation, however, this is done without discussion with locals. Land rights issued do not positively benefit local communities. **GREEN:** Land rights documentation is detailed and accessible. Community is included in land rights discussions, decisions and organisation. An equitable and transparent benefit sharing plan is in place with local stakeholders including indigenous peoples and communities.

Assessing Tree Growing Projects

5.11

CRITERIA	BEST PRACTICE	MEASURE OF SUCCESS/ INFORMATION	SCORING SYSTEM
11. COST	Cost of tree growing project should include the cost of certification (if required), the cost of the sapling, actual planting, long-term maintenance, ongoing monitoring and measuring. Transaction costs associated with identifying willingness for land owners through consultations with the local community. The economic viability of the tree planting practice could also be considered[14].	Documentation should detail costs of all aspects of the tree growing project.	**RED:** No documentation or very little detail on cost of the scheme. **AMBER:** Very little documentation available on cost or specific aspects are not included in documentation. **GREEN:** Detailed cost breakdown including all aspects of the project (e.g. plantation, maintenance, certification, transaction costs, and monitoring). The cost-effectiveness of reforestation strategy has also been considered in the local context (e.g. natural regeneration, seedling, planting).

[14] Crouzeilles R, Beyer, H.L, Monteiro L.M et al (2020) Achieving cost-effective landscape-scale forest restoration through targeted natural regeneration. *Conservation Letters* 13(3), e12709.

Assessing Tree Growing Projects

5.12

CRITERIA	BEST PRACTICE	MEASURE OF SUCCESS/ INFORMATION	SCORING SYSTEM
12. CLIMATE CHANGE ADAPTATION MANAGEMENT	Tree growing projects should take into consideration both the direct and indirect effects of future climate change on the tree planting practice, site location, species suitability, and management approach[15]. Plans should be in place to minimise the potential risks climate change may pose to the project's long term success.	The project management planning shows evidence of suitable mechanisms in place to anticipate and adapt to the effects of climate change on the tree planting project. Climate change may be used to justify species suitability and site location.	**RED:** No consideration of future climate change risks on the objectives of the tree planting project. **AMBER:** Management plan acknowledges the risks of climate change on the objectives of the tree planting project but does not detail plans to minimise these risks. **GREEN:** Management plan takes into account how to mitigate the direct and indirect risks that climate change represents to the objectives of the tree growing project. Contingency plans might be in place.

[15] Löf M, Madsen P, Metslaid M (2019) Restoring forests: regeneration and ecosystem function for the future. *New Forests* 50, 139-151.

Assessing Tree Growing Projects

5.13

CRITERIA	BEST PRACTICE	MEASURE OF SUCCESS/ INFORMATION	SCORING SYSTEM
13. COORDINATION ACROSS SCALES	Tree growing projects are likely part of larger reforestation policy and goals, and organizational decisions need to consider both the global and local scales. Coordination is required between global programmes to ensure allocation of resources, site selection, land uses, and to communicate the needs of multiple stakeholders[16].	Documentation showing authorisation with local authorities and consultation with multiple stakeholders across scales. The goals of the project are defined in the ecological and social context of multiple across stakeholders.	**RED:** No contact or communication with local and/or national entities regarding the tree growing project role in larger policy and goals. **AMBER:** The project is authorized by a local and/or national entity but no involvement of national authorities in the design of the project. Little evidence of consultation regarding the allocation of resources, site selection, balancing land uses, and coordinating goals with stakeholders across multiple scales (local, regional, national, global). **GREEN:** The project has been authorised by a local and/or national entity and fits well into the national strategy to achieve climate goals. Evidence of consultation regarding the allocation of resources, site selection, balancing land uses, and coordinating goals with stakeholders across multiple scales (local, regional, national, global).

[16] Brancalion P.H.S & Holl K.D (2020) Guidance for successful tree planning initiatives. *Journal of Applied Ecology* 57, 2349-2361. Doi: 10.1111/1365-2664.13725

6.1

The Araku Livelihoods Project in India

In Eastern India, the Adivasi tribes in the Araku Valley are among the most disadvantaged in the country. The region has suffered from severe deforestation under English colonial rule, resulting in soil erosion, land degradation and poverty.

The Naandi Foundation works to tackle this poverty by investing in a holistic approach where farming is linked to education and community bonds to grow trees and restore nature to support local livelihoods.

Today, over six million trees have been planted and 6,000 ha of degraded lands restored. The forested land provides shelter and food for wildlife, and income opportunities for local communities, who can harvest crops including coffee beans and mangoes from the new trees. This has also increased food security for small and marginalized communities and improved agricultural productivity.

Case Studies

GENERAL INFORMATION:

Coordinating and managing entity	Livelihoods Funds and Naandi Foundation
Region of implementation	Araku Valley of Visakhapatnam district in Andhra Pradesh
Activities	Planting of a mixture of trees and shrubs on degraded non-forest land
Crediting period	2010-2030 (20 years renewable)
Average annual ERs	80,660 tCO2e
Project Certification	Verified Carbon Standard (VCS)

ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS:

+ **Environmental:** The restoration of 6,000 ha of degraded lands has provided shelter and food for wildlife, especially endemic birds, and sequestration of up to 10 million tons of CO2 over 20 years.
+ **New business:** Organized into "Small and Marginal Tribal Farmers' Cooperatives" the local tribes sell their coffee directly to consumers and the first Araku Coffee store is now open in Paris. Transformed into functional forests, the previously degraded lands of the Adivasi communities are now providing them with food and income.
+ **Food security:** The Adivasi tribes diversified their crop portfolio with 18 varieties of fruit trees per acre, increasing their food security and also their income with the sale of extra fruits. After years of care and attention, mango trees are bearing their first fruits and shortly the communities will be able to produce 12,000 tons of mangoes per year for the local market.

"Transformed into functional forests, the previously degraded lands of the Adivasi communities are now providing them with food and income."

Case Studies

BEST PRACTICES DEPLOYED:

- → A mixture of indigenous and non-indigenous species was chosen through close consultation with the local community to fit existing land-uses
- → The project considers the appropriate tree density and specifies reasons for planting different groups of tree species to form a composition of a diverse set of plantation plots
- → Participatory monitoring has been set up through the Naandi Carbon Survey Team alongside the standard monitoring process established by the livelihoods fund to monitor the impacts on livelihoods
- → Baseline trees were maintained and integrated within the newly planted plantations to provide support a natural fence, shade for young saplings and to support hydrological conditions of sites
- → A default mortality rate was estimated and then fully addressed through replanting during the first years after planting
- → Transparent process has been developed to identify and guarantee legal ownership of the project area parcels by farmers from the local tribal communities
- → The project has adapted to the current governance structure amongst villages in the Araku Valley

6.2

Natural High Forest Rehabilitation in Uganda

Face the Future has been working with the Uganda Wildlife Authority (UWA) on restoring the Kibale forest since 1994.

The project seeks to realise multiple socio-economic and environmental benefits through restoring forest vegetation on degraded lands by creating a forested zone around the edge of the park which will act as a buffer to relieve the interior areas of pressure from agents of deforestation and degradation such as anthropogenically caused fires.

Today, more than 1.5 million indigenous trees have been planted, restoring 6,700 hectares of forest so far. Many of these trees planted since 1994 have reached maturity, creating a contiguous canopy, which allows biodiversity to thrive.

By promoting the regeneration of natural vegetation in the interior of the forest, through the creation of a forested zone around the edge of the park which will act as a buffer, interior areas are also relieved from the pressures of deforestation and degradation such as fires. The reforested forests have also had a positive impact on the water-absorption ability of the forest.

Case Studies

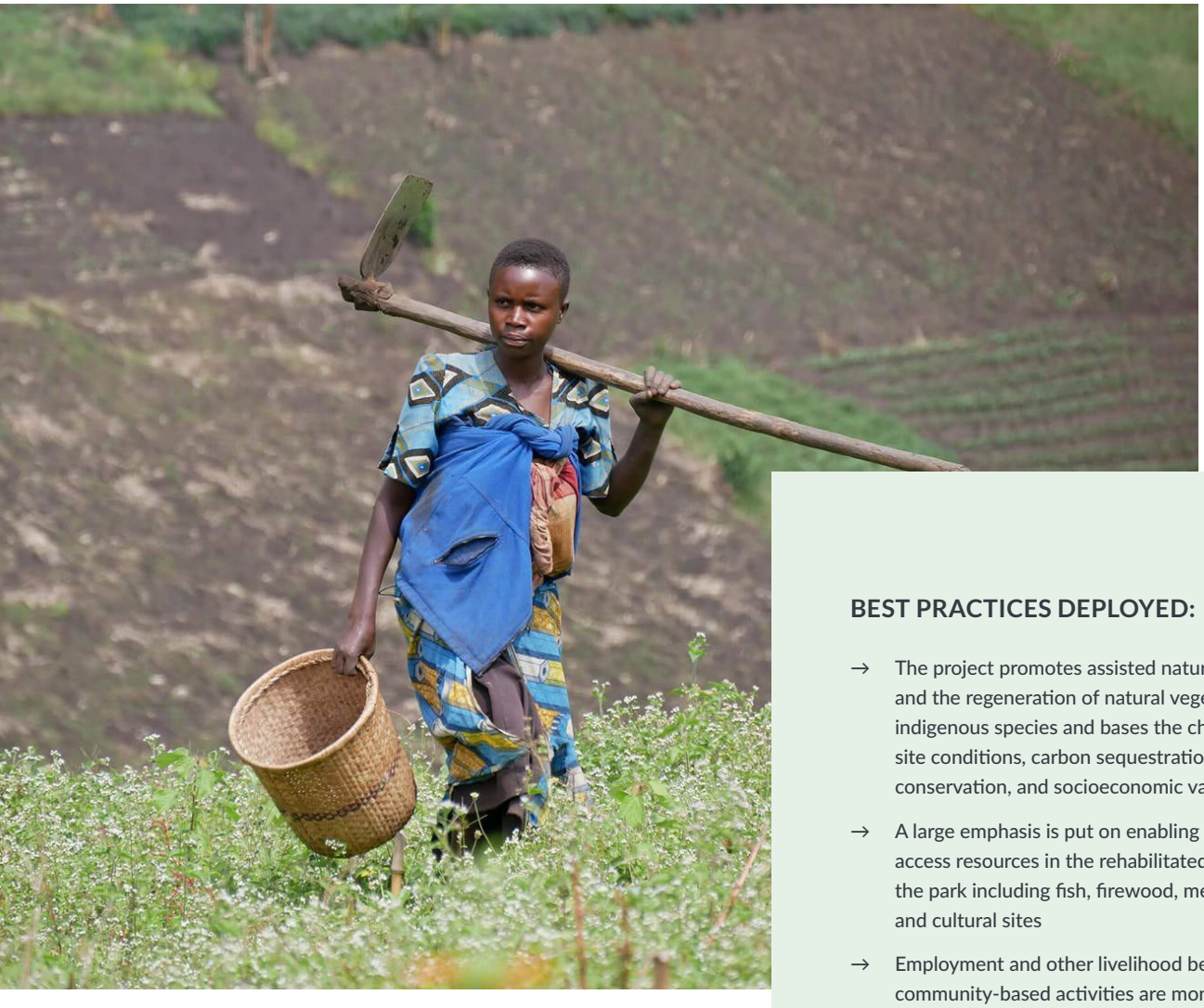
GENERAL INFORMATION:

Coordinating and managing entity	Face the Future and Uganda Wildlife Authority
Region of implementation	Kibale National Park, western Uganda
Activities	Reforestation and local community development
Project start date	1994
Crediting period	2009-2068 (crediting period is shorter than project lifetime because the project switched to another carbon crediting standard in 2009)
Estimated total emission reductions	4,450,862 tCO2e
Project Certification	Verified Carbon Standard and Climate, Community, and Biodiversity Standard

ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS:

+ **Livelihood security:** Face the Future started an agroforestry pilot with smallholders around Kibale National Park. By incorporating more trees and perennial plants, the farm becomes more resilient to erosion and weather extremes. Furthermore, by growing trees on their own land, smallholders can produce their own fuelwood reducing pressure on the national park.
+ **Community empowerment:** All community members are invited to consultation meetings and women are promoted in the participation in decision-making and implementation of project activities. The women from Bujongobe Bakyara Twekambe group, which live near the park entrance, were given eight goats through an application from the project revenue sharing fund.
+ **Employment:** In the past 25+ years the project provided 340 paid jobs within the park, including 140 permanent roles and 200 seasonal roles. Employment and other livelihood benefits from community-based activities are monitored throughout the project and distributed as information to the local community.
+ **Biodiversity:** Through the implementation of the restoration project, the ecosystem of Kibale National Park has been strengthened. We have seen an increase in biodiversity over the last 25 years, including 325 bird species, such as the green-breasted pitta, wildcats including leopards and the African golden cat, as well as more than 350 tree species.

> “We have seen an increase in biodiversity over the last 25 years, including 350 tree species.”



BEST PRACTICES DEPLOYED:

- → The project promotes assisted natural regeneration and the regeneration of natural vegetation using mainly indigenous species and bases the choice of species on-site conditions, carbon sequestration rates, biodiversity conservation, and socioeconomic value
- → A large emphasis is put on enabling local communities to access resources in the rehabilitated forested section of the park including fish, firewood, medicinal plants, grass, and cultural sites
- → Employment and other livelihood benefits from community-based activities are monitored throughout the project and distributed as information to the local community
- → All community members are invited to consultation meetings and women are promoted in the participation in decision-making and implementation of project activities

6.3

BaumInvest Mixed Reforestation in Costa Rica

Climate change is driving rainforest degradation, which is further exacerbated by forest loss, creating a vicious cycle of negative impact.

To tackle this, BaumInvest is reforesting areas of degraded land which border existing biodiversity corridors in Costa Rica, leading to an expansion of habitable areas for plants and animals alike.

By mirroring growth patterns of natural forests, BaumInvest reproduces near-natural forests on degraded grazing lands, using 40 different combinations of slow and fast-growing trees, creating the necessary shade according to the respective plot. This type of reforestation is critical in ensuring the area can withstand more extreme weather conditions. For example, cultivating tree species of different heights makes it harder for hurricanes to uproot trees.

The BaumInvest schemes are one of the first reforestation projects to be certified by the Gold Standard, an internationally recognized independent verification organization. As of 2020, Gold Standard has certified 175,000 metric tons of CO2 stored through BaumInvest projects.

Case Studies

GENERAL INFORMATION:

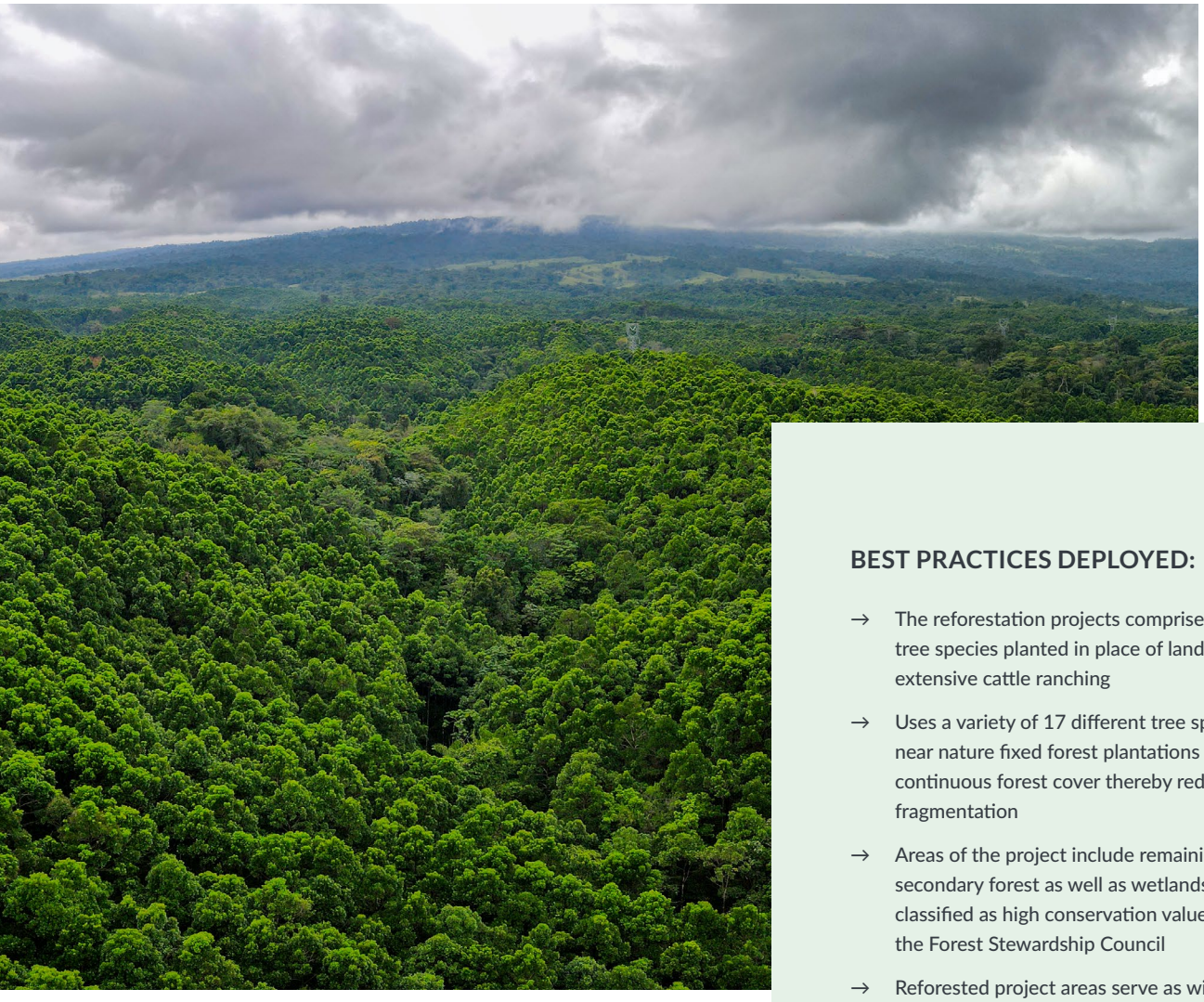
Coordinating and managing entity	BaumInvest AG (based in Germany), BaumInvest SA (based in Costa Rica), Isla Bosque de Costa Rica Tercera Compañía
Region of implementation	Northern zone of Costa Rica
Activities	Reforestation, forest management
Project start date	2007
Crediting period	2007-2037 (30 years)
Estimated emission reductions	3,300 credits annually
Project Certification	Gold Standard (GS)

ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS:

+ **Income security:** By being inclusive of the local community, the reforestation projects act as a magnet holding together new markets in the regions surrounding the fincas. The development of supply chains surrounding the harvest and further processing of timber shows can create a promising income for all of those involved.
+ **Ecosystem benefits:** The restoration projects bring numerous benefits for local ecosystems, including improving soil health and fertility by increasing the diversity of the soil microbiome, and enhancing its carbon storage capacity. The projects also help to restore the water balance in the region, improving resilience during dry periods.
+ **Biodiversity:** Reforested areas form new ecosystems in which animals can reestablish themselves, presenting a decisive contribution to the region's biodiversity. This is attested by the significant leap in the number of bird species observed in the region, rising from 20 to 90 in the 9 years since the project's beginning.

> "The projects also help to restore the water balance in the region, improving resilience during dry periods."

Case Studies



BEST PRACTICES DEPLOYED:

- → The reforestation projects comprises of mainly native tree species planted in place of land used previously for extensive cattle ranching
- → Uses a variety of 17 different tree species planted in near nature fixed forest plantations which promote continuous forest cover thereby reducing forest fragmentation
- → Areas of the project include remaining old-growth and secondary forest as well as wetlands; some of which are classified as high conservation value forests according to the Forest Stewardship Council
- → Reforested project areas serve as wildlife corridors
- → Has a strong monitoring plan in place - has shown that 70 new species of amphibians and reptiles have resettled on the land
- → Gender equality is monitored through women's participation in employment

Bibliography

7.0

7.1

ADDITIONAL LINKS

- → Restoration Opportunities Assessment Methodology (ROAM)
- → What is Forest Landscape Restoration (FLR)?
- → Investing in Forests: The Business Case (June 2021)
- → EcoRegions for Choosing Biomes
- → Free Carbon Finance Handbook

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7.0

7.2

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